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ABSTRACT

This report describes the results of a study of the cost and cost effectiveness of 27 summer reading programs, carried through as part of a large-scale evaluation of compensatory reading programs. Three other reports describe cost and cost-effectiveness studies of programs during the regular school year. On an instructional-hour basis, the total per-student-hour cost was consistently over twice as large for summer programs, as a result of smaller class sizes, more highly qualified staff, and a larger proportion of time devoted to reading. Analyses of cost effectiveness were unable to explain why particular summer programs were above average in effectiveness. (AA)

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RMC Report

UR-231

AN EVALUATION OF THE COST EFFECTIVENESS OF ALTERNATIVE COMPENSATORY READING PROGRAMS

Final Report in Four Volumes

Volume IV: Cost Analysis of Summer Programs

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April 1976

Prepared for

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SUMMARY

Volume IV describes the results of a comprehensive study of the cost and cost effectiveness of 27 summer reading programs throughout the United States. This work was undertaken by RMC Research Corporation as part of a large-scale evaluation of compensatory reading programs conducted by the Educational Testing Service (ETS) for the U.S. Office of Education.

The evaluation study involved an examination of compensatory reading programs in 256 public elementary schools across the nation during the 1972-73 school year. For this study, compensatory reading programs were defined as reading instruction given to pupils because they were reading below grade level.

Of the total schools involved in the study, approximately 126 schools had compensatory reading programs funded by ESEA Title I, 80 had compensatory reading programs funded from sources other than ESEA Title I, and 30 had no identified compensatory reading programs. The remaining schools (approximately 34, 28 of which were funded by ESEA Title I) were included because they were considered to be exemplary programs.

In each school, all the students in the second, fourth, and sixth grades were given special pre- and post-tests to determine reading achievement and changes in attitude during the school year. Detailed attendance records were kept of pupil participation in reading classes. In addition, the principal and all teachers of students in the affected grades completed questionnaires describing the demographic characteristics of the students and their own approaches to teaching. Finally, the principal completed a questionnaire that identified and enumerated the resources in the school.

RMC's responsibility in this study was to first estimate the cost of the individual programs. Then, using measures of program effectiveness developed by ETS, RMC evaluated the cost-effectiveness of each program. The results of RMC's work are presented in four volumes, each of which is described below:

- Volume I: Cost Analysis--this volume develops and uses the methodology for estimating the cost of compensatory reading programs. The resulting cost estimates are presented and analyzed.
- Volume II: Model Sensitivity--this volume examines the methodology developed in Volume I to assess the impact of alternative cost allocation rules and to measure errors.
- Volume III: Cost-Effectiveness Analysis--this volume examines the cost-effectiveness of alternative compensatory reading programs using the costs developed in Volume I.
- Volume IV: Cost and Cost-Effectiveness Analysis of Summer Programs--this volume uses the procedures and methodologies developed in the first three volumes to conduct an independent examination of the summer programs.

This summary describes the major results and conclusions found during RMC's analysis of the cost and cost effectiveness of summer programs.

COST-ESTIMATING MODEL

The cost-estimating model developed in this volume is essentially identical to that developed in Volume I for estimating the cost of the regular school year program. The approach used to estimate costs is the resource approach, which attempts to identify all the resources employed in a program. The only significant theoretical difference is a correction factor to account for the differential lengths of the summer programs. The basic equation that represents the theoretical structure of the cost model is

$$\text{Cost of class } j = \sum_i n \cdot p \cdot c \cdot r \cdot f.$$

The equation reads as follows: the cost of reading in class j is equal to the sum over all resource items i of the product of the quantity of that particular resource (n), times the proportion of the time the resource item is used in reading (p), times the annualized cost of one unit of the resource item (c), times the proportion of the resource item that can be allocated to this particular reading class (r), times a factor accounting for the differential lengths of the summer programs (f).

For each resource (staff, facilities, equipment, and materials), a separate calculation is made for each of the five factors above. These calculations are similar to those described in Volume I of this report. In general, however, the equations used here are somewhat simpler because the summer programs are usually less complex.

OVERVIEW OF DATA SOURCES

The program cost and resource data were derived from three basic sources. The first source was the results from the extensive data collection and analysis effort of Phase II. Essentially all of the Phase III resource unit costs--from classroom teachers to district centers--were obtained from the Phase II effort. Since, in most cases, the special summer compensatory reading programs were located in the same schools as the reading programs examined in the regular school year study, data concerning inventories of equipment and materials and other descriptive characteristics could be used again for this study.

The second source of data was the site visit interviews conducted by RMC field staff with the summer program principals and administrators. The guidelines used in these interviews had three basic parts:

(1) descriptive characteristics of the summer program in terms of objectives, successes, failures, etc.;

(2) quantitative information on the resources used in the summer program, especially staff and district services; and

(3) quantitative information on the available resources of facilities, equipment, and materials if the summer program was operating in a school that was not part of the Phase II analysis.

The third source of data was from ETS-designed and -implemented instruments. Three instruments were particularly useful--the Teacher Characteristics Questionnaire (containing teacher education and experience), the Program and Class Characteristics Questionnaire (containing class size, grade level, and data about the utilization of teacher aides, equipment, and materials), and the attendance sheets (also containing the class size and grade distribution).

Basically, the first two sources established the baseline school data, while the third described the individual differences between classrooms. The data from the first two sources were provided primarily by school administrators and principals, and the third by classroom teachers.

RESULTS OF COST ANALYSIS

The average cost in dollars per student for the major cost categories is presented in Summary Table 1. It is interesting to note that almost 90 percent of the cost of summer programs is associated with staff. Comparing this with the regular year programs, where staff represents approximately 70 percent of the total cost, it is obvious that summer programs are much more staff-intensive than regular programs.

Summary Table 1

AVERAGE GRADE WEIGHTED COSTS BY MAJOR RESOURCE CATEGORIES[a]

(dollars per student)

		Grade 2	Grade 4	Grade 6	All Classes
Total		56.07 (31.08)	54.28 (29.15)	45.68 (27.82)	59.83 (31.88)
Staff		49.49 (27.80)	48.05 (26.12)	40.56 (25.71)	52.79 (28.51)
	% of Total	.883	.885	.888	.882
Facilities		4.95 (3.20)	4.90 (3.14)	3.86 (2.21)	5.52 (3.40)
	% of Total	.101	.090	.084	.092
Equipment		.72 (1.05)	.37 (.33)	.28 (.30)	.58 (.78)
	% of Total	.013	.007	.004	.010
Materials		.78 (.68)	.83 (.56)	.84 (.62)	.80 (.75)
	% of Total	.014	.015	.018	.013
District Center		.13 (.31)	.12 (.31)	.16 (.37)	.10 (.27)
	% of Total	.002	.002	.004	.002

[a] The quantities in parentheses below the average values are the standard deviations.

As can be seen in Summary Table 1, there is a great amount of variation in the observed costs. An attempt was made to explain the variance by examining program length, the amount of time devoted to reading, and the number of students in the class. This factor can greatly affect costs and their distribution since they relate the available resources in the schools to those that were actually used. It was surprising to find that eliminating the effect of program length from the total cost did not appreciably affect the distribution. However, effective class size and proportion of time devoted to reading can heavily influence the large variation of costs found in the summer programs. This is especially true if the schools that offer many subjects other than reading have large effective class sizes and the schools that offer only reading have very small effective class sizes. For example, large class sizes tend to occur in schools where reading is taught a small proportion of the time. Similarly, small class sizes tend to occur in schools where reading is taught all the time. As a result, the difference in costs between the reading programs is exaggerated.

A series of analyses of variance were conducted in an attempt to identify significant differences in cost between various types of programs. The results of these analyses are summarized below:

- There was a great difference in cost between schools rather than within schools. In addition, there was no statistical difference in cost between grades. This indicates that future cost analyses of summer programs can be performed at the school level without loss of significance.
- Summer programs receiving ESEA Title I funding cost significantly more per student than programs not receiving ESEA Title I funding, averaging 75 percent more.
- Summer programs that emphasized remedial or compensatory reading instruction were significantly more expensive than programs that were directed toward enriching the life of the student. Remedial classes averaged approximately 150 percent more.

An analysis was conducted that compared the costs of the summer programs with the costs of regular programs given during the year. The higher portion of the costs attributed to staff in summer programs has already been highlighted. On an instructional hour basis, the total per student-hour cost was consistently over twice as large for summer programs. The class instructor per student-hour cost was consistently over three times as large for summer programs. Smaller class sizes, more highly qualified staff in terms of education and experience, and a larger proportion of time devoted to reading are the reasons for this. On an instructional week basis, the summer program had, on the average, a 44 percent greater total per student-week cost and a 102 percent greater class instructor per student-week cost.

COST-EFFECTIVENESS ANALYSIS

ETS categorized schools with summer programs into three general groups of effectiveness: above average, average, and below average. The effectiveness measure was based on pre- and post-test scores of second- and fourth-grade students on the reading subtest. In addition, schools were only included if complete spring-summer reading subtest data were available for them. ETS obtained complete spring-summer reading subtest data from 22 schools having summer programs for second-grade students and 17 schools with summer programs for fourth-grade students. The number of schools classified at each level of effectiveness is shown below:

	Number of Schools	
Effectiveness Category	Second Grade	Fourth Grade
Above average	3	2
Average	16	13
Below average	3	3
Total	22	17

Since differences were present in the various costs per student and the program/school characteristics among schools with summer programs, RMC conducted a series of analyses of variance to determine if the differences could be explained by the level of effectiveness. In addition, funding source and type of program were also examined. Unfortunately, none of the analyses produced results that offered a meaningful basis for explaining why particular summer programs were above average in effectiveness.

These results, however, should not be considered conclusive since the sample size was small and unevenly distributed among the effectiveness categories. The number of schools classified as above- and below-average were especially small (three in each category for second-grade programs and two in each category for fourth-grade programs) for analysis purposes. As a result, we had to stretch what could be accomplished statistically with the sample. We were looking for gross indicators of relationships and found none of major consequence.

1

INTRODUCTION

SCOPE AND STUDY OBJECTIVES

This report presents the results of a cost and cost-effectiveness analysis of special summer compensatory reading programs in selected elementary schools across the nation. This study was designed to complement and support an evaluation of the effectiveness of special summer compensatory reading programs conducted by the Educational Testing Service (ETS) for the U.S. Office of Education.

BACKGROUND OF ETS STUDY

In July 1971, ETS began a survey of public elementary schools and selected features of their reading programs. The study had three phases. The first phase involved a descriptive and analytic study of reading programs in grades 2, 4, and 6 in 731 schools thoughout the United States. Phase II included a comprehensive evaluation of the programs for a sample of 256 of the schools for the 1972-73 school year. The goal was to determine how students benefitted from various reading methods and categories of instruction. In addition, the cost effectiveness of the various methods was examined. Phase III involved a similar evaluation of special summer compensatory reading programs in 27 schools during the summer of 1973.

ETS used a number of instruments for recording the necessary data and descriptions of the schools and their reading programs. The instruments included standardized tests to determine reading achievement and student attitudes toward reading, class attendance records, and principal and teacher questionnaires for collecting program and demographic characteristics. While these questionnaires determined the use of various types of resources (staff, equipment, facilities, and materials) in the reading program, no attempt was made to quantify the amount of resources available to the teachers. For this reason, in October 1972, ETS selected RMC Research Corporation to develop a supplemental resource survey and to actually conduct the cost-analysis and cost-effectiveness evaluations for the Phase II study. The results of RMC's contribution to the study can be found in Volumes I, II, and III of this report. In August 1973, RMC was also selected to perform the cost analysis and cost-effectiveness analysis of the summer program under Phase III of the study. That activity is the subject of this volume.

OVERVIEW OF SUMMER READING PROGRAMS

This study involved collecting data from 27 summer programs throughout the United States. These programs ranged in length from four to eight weeks. The hours of class instruction varied from 54 to 173 hours, averaging approximately 96 hours. The average enrollment in the summer programs was 107 pupils, with one school having a low of 4 pupils and another a high of 249. The average class size was between 12 and 13 pupils. Although grade levels ranged from prekindergarten through grade nine, the primary emphasis was on kindergarten through grade three. The focus of the summer programs was primarily remedial. However, a significant proportion emphasized the enrichment of the students' academic program. Although one of the primary objectives of the summer programs was to keep the children from experiencing "summer fall-back," there was also a great deal of concern about maintaining voluntary attendance by stimulating the children's enjoyment of the program. In addition, the schools generally had a secondary goal of increasing the socialization of the children by improving their self-concepts and attitudes toward school. To accomplish these goals, most summer programs taught reading as well as mathematics, but placed a strong emphasis on other areas such as art, music, and crafts, where a student's interest could be held more easily. The atmosphere in the summer programs was relaxed and informal, with a higher ratio of teachers to pupils than during the regular academic term. Usually, the program was free to those who attended; in the cases where this was not true, the charge was very minimal. The programs tended not to make extraordinarily high use of instructional equipment or materials, but kept the interaction at a personal level through individualized instruction. Thus, from a cost-analysis point of view, the summer programs appeared more staff-intensive than the regular academic term programs. The summer programs used resources, such as instructional equipment and materials, about as much as the regular school year programs.

However, the summer and regular school year sessions were quite different in other respects. The contrast between them in terms of enrollment, weeks per session, hours per day, number of subjects taught, instructional atmosphere, quality of attendance, etc., is significant. Thus, comparisons between the two sessions must be made with care.

DATA SOURCES

The program cost and resource data were derived from three basic sources. The first source was the results from the extensive data collection and analysis effort of Phase II. Essentially all of the Phase III resource unit costs --from classroom teachers to district centers--were obtained from the Phase II effort. Since, in most cases, the special summer compensatory reading programs were located in the same schools as the reading programs examined in the regular school year study, data concerning inventories of equipment and materials and other descriptive characteristics could be used again for this study.

The second source of data was the site visit interviews conducted by RMC field staff with the summer program principals and administrators. The guidelines used in these interviews had three basic parts:

(1) descriptive characteristics of the summer program in terms of objectives, successes, failures, etc.;

(2) quantitative information on the resources used in the summer program, especially staff and district services; and

(3) quantitative information on the available resources of facilities, equipment, and materials if the summer program was operating in a school that was not part of the Phase II analysis.

A copy of the interview guidelines can be found in Appendix A.

The third source of data was from ETS-designed and -implemented instruments. Three instruments were particularly useful--the Teacher Characteristics Questionnaire (containing teacher education and experience), the Program and Class Characteristics Questionnaire (containing class size, grade level, and data about the utilization of teacher aides, equipment, and materials), and the attendance sheets (also containing the class size and grade distribution).

Basically, the first two sources established the baseline school data, while the third described the individual differences between classrooms. The data from the first two sources were provided primarily by school administrators and principals, and the third by classroom teachers.

OVERVIEW OF REPORT

Chapter 2 of this report develops the basic methodology used in estimating the costs of summer reading programs. In general, this methodology mirrors the methodology developed in Volume I of this study. Chapter 3 presents the actual costs resulting from the cost-estimating model. In addition, it examines the results in an attempt to identify the source of variance. Chapter 4 analyzes the cost estimates in greater detail in an attempt to find significant differences in cost in different types of programs. Finally, Chapter 5 examines the cost effectiveness of the various programs.

2

READING PROGRAM COST MODEL AND UNIT COSTS

The reading program cost model presented in this chapter describes the procedure RMC developed for estimating the cost of providing reading instruction in summer compensatory reading programs. In its theoretical approach, this cost model followed the one developed for the regular academic term reading programs.[1] The general methodology employed the resource approach to costing, where the actual resources a program uses are quantified, multiplied by their associated unit costs, and summed to give the total cost. This model is especially helpful in estimating the cost of programs and can be used to compare the costs and cost effectiveness of various alternative programs. In addition, it can be a useful tool when planning a particular type of program.

However, the summer program cost model and the regular term program cost model differ in two ways. First, certain simplifying assumptions were made in the summer version based on the findings and results of the regular term cost model. Usually, those assumptions were made in areas where the added complexity and detail of the regular term model would not contribute to the accuracy or usefulness of the summer program results. Second, more of the calculations were performed manually instead of by the automatic data processing that was used in the regular term reading program cost model.

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[1] Paul Dienemann, Donald Flynn, and Nabeel Al-Salam, An Evaluation of the Cost Effectiveness of Alternative Compensatory Reading Programs, Vol. I: Cost Analysis (Bethesda, Maryland: RMC Research Corporation, 1974).

MODEL STRUCTURE

The resources used in a summer compensatory reading program were placed into a set of resource categories defined to be staff, facilities, equipment, materials, and district centers. The list of all resources in these categories made up the resource item list presented in Table 1. However, all of these resources did not appear in the final output of the cost model. The final output displayed the costs at a higher level of aggregation than the input list of resource items. For instance, in the resource category of staff, the district personnel, principal, and secretary and clerical staff resource items were aggregated under the heading of supervision and coordination staff. This was done to simplify the analysis and display of the cost-analysis results.

In addition to the obvious costs, each resource item included many overhead and support items as part of its unit cost. For instance, the resource item labeled tape recorders/record players included not only the named pieces of equipment, but also the software normally associated with them--for example, tapes and records. Since all capital equipment requires a certain amount of repair and maintenance, an allowance was made for this in the cost of the equipment. Therefore, classroom space included the capital cost of the classroom and a portion of the support space such as hallways, faculty and administration offices, gymnasiums, cafeterias, etc. The cost of facility space also included a portion of the cost of the maintenance staff and their necessary supplies.

The basic equation that represented the theoretical structure of our cost model was

$$\text{Cost of class } j = \sum_{i} n \cdot p \cdot c \cdot r \cdot f.$$

The equation reads as follows: The total cost of reading in class j is equal to the sum over all resource items i of the product of the quantity of that particular resource (n), times the proportion of the time the resource item is used in reading (p), times the annualized cost of one unit

Table 1

RESOURCE ITEM LIST

Resource Category	Resource Item
Staff	Class Instructor Teacher Aide Reading Specialist Nonteaching Academic Staff Nonteaching Non-Academic Staff District Personnel Principal Secretary and Clerical
Facilities	Classroom Space
Equipment	Tape Recorders/Record Players Technological Devices/Teaching Machines Movie Projectors/Filmstrip Projectors Slide Projectors Television and Video Equipment
Materials	Basal Readers Programmed Instruction/Educational Kits Library Resources Instructional Supplies
District Centers	Student Centers (Staff Intensive) Resource Centers (Materials Intensive)

of the resource item (c), times the proportion of the resource item that can be allocated to this particular reading class (r), times a factor accounting for the differential lengths of the summer programs (f).

This sounds quite complicated, but, actually, it is not. The calculation can be conceptualized in three steps:

(1) The first step is to calculate the cost of all available resources in the school on the basis of the summer program's length:

$$\text{Total cost} = \sum_i n \cdot c \cdot f.$$

(2) The second step is to allocate a proportion of this cost to reading subject activities:

$$\text{Cost for reading} = \sum_i n \cdot c \cdot f \cdot p.$$

(3) The third and final step is to allocate a portion of this cost for reading to a particular reading class:

$$\text{Cost for reading in class } j = \sum_i n \cdot c \cdot f \cdot p \cdot r.$$

The final equation is identical to the one we introduced earlier, but the factors are arranged slightly differently. This is a simplistic description of the general approach to the cost model that we will describe in more detail shortly.

UTILIZATION AND ALLOCATION FACTORS

The following discussion of the utilization and allocation factors is generally applicable to the five major resource categories. We will discuss three factors:

(1) summer program length factor (f),
(2) reading program factor (p), and
(3) classroom allocation factor (r)--
    - uniform allocation to pupils, and
    - allocation to classes based on use.

Summer Program Length Factor

The length of the summer programs varied considerably, and this variation had a considerable impact on the cost of the program. Some summer programs were as short as four weeks, while others were as long as eight weeks. Also, the number of hours per day the program was in session varied. Thus, a factor reflecting this variation in length for the summer programs was necessary.

The following equation represents the algebraic form of the summer program length factor:

$$f = \frac{PL}{1{,}080},$$

where

PL = program length (the number of days the summer program was in session multiplied by the number of hours each day the program met), and

1,080 = the number of instructional hours in the typical regular term (180 days times 6 hours per day).

The values of this factor for the 27 schools are presented in Table 2, including the values of the mean and standard deviation.

The results of the cost analysis represent the total reading costs of the summer program, and will be used in the cost-effectiveness analysis. However, such costs make comparisons between schools difficult because of the variation in program length. For this reason, the costs will also be presented on a per week basis.

The unit costs of all resource items in the summer reading program cost model are based on a full academic year. Thus, the cost of a teacher is his annual salary and associated fringe benefits. The cost of equipment and facilities represents their annual depreciation, operating, and maintenance costs. The summer program length factor is used to proportion these annual costs down to a value consistent with the length of the summer program.

Reading Program Factor

This factor represents the portion of a program's time that is spent in the instruction of reading, and the proportion of the program's utilized resources that are attributed to reading.

Table 2

SUMMER PROGRAM LENGTH FACTORS

School ID	Program Days	Program Hours Per Day	Program Length (Instructional Hours)	Summer Program Length Factors
5	30	4	120	.1111
12	18	3	54	.0500
20	25	2.5	63	.0583
28	20	3	60	.0556
30	30	3	90	.0833
41	30	3	90	.0833
46,47	25	4	100	.0926
71	25	4.5	113	.1046
99	25	2.4	60	.0556
104	25	3	75	.0694
109	30	3	90	.0833
119	30	3	90	.0883
168	24	2.5	60	.0556
232	30	3	90	.0833
249	30	5.75	173	.1602
254	25	4	100	.0926
294	30	4	120	.1111
306	25	4	100	.0926
317	25	3.5	88	.0815
359	30	3.25	98	.0907
369	30	4	120	.1111
906	40	4	160	.1481
908	30	4	120	.1111
915	20	4	80	.0741
917	30	3.58	107	.0991
922	30	3.58	107	.0991
928	20	4	80	.0741
Mean	27.08	3.61	96.60	28.29
Standard Deviation	4.75	.71	28.29	.0260

For most resources within a given school, the reading program factors for the various classes were generally equal. The major exception to the rule was the manner in which the cost of the instructor was allocated to the classroom. In the case of a self-contained classroom, where a single teacher has the responsibility for a group of students during their entire stay in school, the reading program factor represents the proportion of time the teacher teaches reading to her students. In the case of a teacher that teaches four classes of reading to different students, the reading program factor would be equal to one, indicating that the teacher teaches only reading. The number of students in the class would be the sum of all the students in the four classes the teacher teaches. This type of representation occurred in two specific instances: (1) where the subjects were departmentalized in structure, and (2) in cases where students took only the courses they were interested in; that is, a student might have taken only reading, or reading and math, or reading, math, and crafts.

The use of the reading program factor and the total number of students in the class created one particular difficulty: With that information alone, it was not possible to determine whether a single teacher taught a few students for short periods or a larger number of students for longer periods. That is, if the class size was 50 and the reading factor one, there was no way to tell if a teacher taught two reading classes of 25 students each or one reading class of 50 students that was twice as long.

A similar situation involved team teaching, where several teachers taught a large class. The class was usually split into several groups for instruction, with the teachers specializing in subject areas. To resolve the problems in interpreting the relationship between the reading class factor and the total number of students, the number of sessions a class represented has been included in the displayed cost data.

Classroom Allocation Factor

The unit of analysis in the summer reading program cost model is the classroom. The cost outputs that are displayed are per pupil costs. Thus, the model distributes resources and their associated costs to classrooms.

Uniform Allocation to Pupils

Some resources that were within the scope of the summer reading program cost model could not be feasibly allocated to classrooms in any other way except uniformly. Examples include the principal, district personnel, clerical staff, the cost of district-operated centers, etc. The cost of these resources to a particular school was divided by the enrollment to give the cost per pupil of each resource. This was in turn multiplied by the number of pupils in the class to yield the class cost for the resource.

Allocation to Classes Based on Use

Other resources were allocated to classes depending on their use of the resources. Examples include teacher aides, instructional equipment, and some instructional materials. In these cases, weights were assigned to each class and the resource was distributed to the class in relative proportion to the weights.

COST MODEL PARAMETERS

The summer reading program cost model calculation of the cost of each of the resource items in a particular classroom is represented by

$$\text{Cost} = n \cdot p \cdot c \cdot r \cdot f,$$

where

n is the quantity of a resource item,
p is the proportion of the resource used in reading,
c is the cost (annually) of one unit of a resource item,
r is the proportion of the resource used in a particular class, and
f is the summer program length factor.

The following paragraphs address these parameters for each resource item. Minor differences in the methodology used to calculate the parameters will be highlighted. The differences are caused by the placement of the resources in the educational system, the manner in which the resources are used or allocated to a class, and the form of the data available to calculate the parameters.

STAFF MODEL PARAMETERS

Eight different types of staff members were considered in the cost analysis of summer compensatory reading programs. The following paragraphs discuss each of them individually. The methodology for calculating the parameters of the model and the data sources are also reviewed. In each case, the quantity of a staff resource, n, is the number of full-time equivalents of that staff type available in the school during the summer. Full-time equivalent is defined as the number of hours a day that a certain staff type is available in a school divided by the "usual" number of hours a day the program is in session.

Class Instructor

During the Phase II analysis, a reliable standardized salary equation for teachers was derived from salary schedules for 260 schools across the nation. In that equation, the unit cost of the resource called class instructor was the annual salary and associated fringe benefits of a teacher. The annual salary for teachers was based on educational background and years of teaching experience.

However, the summer program teachers were not usually paid according to their experience and education. Instead, the summer programs used several other methods, including lump-sum payments, fixed hourly wages, hourly wages commensurate with the regular school year salary, and other variations. (The actual compensation methods used by the summer programs are presented in Table 3.)

Although the summer programs did not base teacher salaries on experience and education, we felt consideration should be given to these factors in our analysis for the sake of comparability between the costs derived for the summer programs and those derived for the regular school session. In addition, this method will provide a means of determining the cost effectiveness of staff members with more or less teaching experience and education in future cost analyses.

Table 3

ACTUAL SALARIES PAID SUMMER SCHOOL TEACHERS[a]

School ID	Description of Compensation Method	Effective Hourly Wage
5	Fixed Amount - $600	$ 5.00
12	Fixed Amount - $500	$ 8.06
20	Fixed Amount - $700	$ 9.66
28	Summer Teaching Experience - 1st year - $80/week 2nd year - $90/week	$ 6.00
30	Fixed Amount - $850	$ 9.44
41	Fixed Amount - $700	$ 7.53
46,47	Fixed Amount - $9.33/hour	$ 9.33
71	Fixed Amount - $685	$ 5.48
99	Degree, Teaching Experience, and Summer Teaching ($600-$1,200)	$15.00
104	Based on Regular Term Salary - 1/250 of annual salary per day ($1,000 and up)	$12.66
109	Fixed Amount - $575	$ 6.39
119	Fixed Amount - 5.50/hour	$ 5.50
168	Fixed Amount - $450	$ 5.54
232	Based on Regular Term Salary - $850	$ 9.56
249	Based on Regular Term Salary - 1.5 of regular salary schedule per hour	$ 9.92
254	Adult Education Salary Schedule (slightly higher than regular) - 1st week - $30-$42/day, 2nd week on - $35-$47/day	$ 7.70
294	Fixed Amount - $1,000	$ 8.33
306	Fixed Amount - $675	$ 6.75
317	Fixed Amount - $6.00/hour	$ 6.00
359	Fixed Amount - $7.50/hour	$ 7.50
369	Based on Regular Term Salary Full time (4 hrs./day) - 12/10 of regular term monthly salary, Half time (2 hrs./day) - 7/10 of regular term monthly salary	$16.64
906	Based Regular Term Salary - 4/7 of regular term monthly salary	$ 6.45
908	Fixed Amount - $600	$ 3.99
915	Fixed Amount - $5.00/hour	$ 5.00
917	Based on Regular Term Salary - 1.0 of regular term monthly salary	$ 6.87
922	Based on Regular Term Salary - 1.0 of regular term monthly salary	$ 6.87
928	Fixed Amount - $29.00/day	$ 7.25
	Average	$ 7.94

a. These wages are based on the 1973 summer sessions.

Therefore, we decided to use the following procedure for the summer term:

(1) The annual salary schedule that was derived during the study of the regular academic term was converted into an hourly equivalent wage.

(2) The average actual hourly wage paid to teachers during the summer was determined from data collected during the summer site visits.

(3) A proportionality factor was calculated that was equal to the actual summer average hourly wage divided by the average regular session hourly wage.

(4) This factor was multiplied by the original teacher annual salary based on experience and education. The new schedule reflected the slightly smaller hourly wage paid to teachers during the summer program. Table 4 presents the wage formula based on teaching experience and educational background.

The class allocation factor for the class instructor was equal to 1.0. Thus, one full-time equivalent teacher was attributed to each class. The value of the reading program factor depended on the type of class or class instructor.

Teacher Aides

The hourly wage rate paid to teacher aides in the summer programs did not differ much from the wage rate paid during the regular school term. Thus, the effective annual salary of a teacher aide was computed by multiplying the average hourly wage rate by 1,080 (representing a 180-day session). (The assumption of an aide working 36 weeks or 180 days during the regular school session is valid in the majority of cases, although some school systems do go slightly longer.) The average hourly rates reported for teacher aides by the participating summer compensatory reading programs are shown in Table 5. As you can see, the effective annual salary for a teacher aide was computed to be $2,754.

The class allocation factor in the case of teacher aides was not as simply derived as it was for the class instructor. The site visits gathered information on the number of paid teacher aides and the number of teachers that received assistance from those aides. On the Program and Class Characteristics Questionnaire, teachers reported whether they received assistance

Table 4

TEACHER ANNUAL SALARY SCHEDULE [a, b]

Educational Background Teaching Experience	No Degree	AA	BA	MA	PhD
1 year or less	6,671	6,671	7,902	8,786	9,283
1 - 3 years	7,034	7,034	8,458	9,406	9,891
3 - 6 years	7,516	7,516	9,199	10,236	10,704
6 - 10 years	8,360	8,360	10,494	11,683	13,126
10 - 20 years	8,963	8,963	12,161	13,597	14,360
more than 20	8,963	8,963	12,161	13,597	14,360

a. These schedules have been adjusted by a factor of 0.92 to reflect the slightly lower wages paid to summer program teachers.

b. These salaries are based on the 1972-73 school year and the 1973 summer session.

Table 5

TEACHER AIDE HOURLY WAGES[a]

School ID	Hourly Wages	Actual Summer Earnings
28	$ 1.50	$ 90.00
41	2.20	198.00
109	1.65	148.50
119	1.75	157.50
168	2.75	165.00
232	2.00	180.00
254	2.50	250.00
317	6.00	528.00
908	2.50	300.00
928	$ 2.66	$ 212.80
Average	$ 2.55	
Standard Deviation	$ 1.29	
Effective Annual Salary[b]	$2,754	

a. These hourly wages are based on the 1973 summer sessions.

b. Assuming the typical aide works 36 weeks, 30 hours per week (6 hours per day).

from aides "often," "sometimes," "rarely," or "never." Based on the experience gained during the Phase II analysis, the response of "often" was assigned a relative use weight of 1.0, "sometimes" a weight of 0.5, "rarely" a weight of 0.1, and "never" a weight of 0.0.

An algorithm was developed to calculate the class allocation factor for teacher aides similar to that developed for the regular year cost estimating model (see Eq. 2-20 of Volume I of the report). Basically, this algorithm involved dividing the weight assigned to a particular classroom by the total weight assigned to all classrooms. Unfortunately, only those teachers whose children were involved in the regular year study completed questionnaires. Thus, an estimate of the school total weight could not be determined from the questionnaires because not all teachers completed questionnaires. To correct for the missing responses, an assumption was made that, on the average, the teachers who completed questionnaires were similar to those who did not. Based on this assumption, an estimate of the school total weight was made by multiplying the total weight from the questionnaires by the ratio of total classes in the school to the number of questionnaires.

In equation form, this algorithm can be written as follows:

$$r_j = \frac{w_j}{\sum_{i=1}^{n} w_i \cdot \frac{N}{n}} ,$$

where

r_j = the class allocation factor for teacher aides to class j,
w_i = the relative use weight of class i for teacher aides,
n = the total number of classes completing questionnaires, and
N = the total number of classes in the school that use teacher aides.

The reading program factor for teacher aides in a particular class was equal to the general school reading allocation factor, which was based on the proportion of instructional hours in reading.

Reading Specialist

The unit cost for a reading specialist in the summer reading program cost model was the same one used for the regular school session analysis. There are two reasons for that decision:

(1) It is important to use standardized costs in the cost analysis of summer compensatory reading programs so the calculated class costs will be comparable across schools.

(2) The number of summer reading programs that used reading specialists was not high enough to yield a reliable figure for the standardized unit cost of reading specialists.

Volume I of this report gives a detailed discussion of the derivation of these costs.

The calculation of the per pupil cost of a reading specialist's services was somewhat different from that of a classroom teacher or a teacher aide. The class allocation factor of a reading specialist resembles that of teacher aides in that the reading specialist is a resource available at the general school level and distributed to classes within the school. However, based on the number of students in the class, all classes were uniformly allocated the cost of a reading specialist. There was no allocation scheme based on the relative use of a reading specialist's services as in the case of a teacher aide. The classroom allocation factor for a reading specialist was equal to the number of students in the class divided by the total number of students in all classes in the school.

Therefore, the cost of a reading specialist for a particular class was proportional to the number of students in the class. The displayed cost for a reading specialist in that class was the total cost of the reading specialist divided by the school enrollment, which was the cost per pupil of this resource. The reading program factor (p) was assumed to be 1.0 for reading specialists because of the nature of the responsibilities in this position.

Other Staff

The "other" staff types included nonteaching academic staff, nonteaching non-academic staff, district personnel, principals, secretaries, and clerical staff. For the sake of simplicity, district personnel, principals, secretaries and clerical staff were combined into the category of supervisory and coordination staff on the output form. The remaining staff types were all treated similarly in the summer reading program cost model. As a result, the following discussion will be relevant to all these staff types.

As in the case of the reading specialist, the unit cost or salaries of these staff types were based on their salaries as determined from the regular school session cost analysis. Since the number of schools that had each of these staff types was not large enough to yield a reliable standardized cost, the standardized costs derived during the regular school session study were far more useful. The standardized costs, or salaries, of these staff types are presented in Table 6. The original cost analysis included multiple staff types under the headings of nonteaching academic staff and nonteaching non-academic staff. But, for the summer programs, the individual staff types were averaged to give a cost for the broader staff category.

The cost of the "other" staff types was distributed uniformly to all students in the school. Thus, the class allocation factor for them was the number of students in a class divided by the school enrollment. The total cost to a class was dependent on the number of pupils in the class. The reading class factor, or the proportion of staff effort that contributed to the reading program, was the average reading class factor for the school, or the proportion of class hours devoted to reading.

FACILITY MODEL PARAMETERS

A summer reading program, like any other program, uses a certain amount of facility space. Conceptually, it is somewhat difficult to calculate the true cost of facility space that this program should be assigned. The school building and classroom space or facilities were designed and built for the regular academic term program, and thus are inherited or sunk resources. In addition, many of these facilities are idle during the summer months. Some cost analysts would regard the use of these facilities in the summer program as bearing no additional cost to the system, except for minor maintenance and cleaning expenses. As a result, the opportunity cost of using these resources in the summer would be near zero. However, this is only true if the value or life of a school is not dependent on whether it is used in the summer. But if the life of a school building is even partially

Table 6

UNIT COST OF OTHER STAFF TYPES[a]

	Annual Salary
Reading Specialist	$12,225
Nonteaching Academic Staff	$13,250
Nonteaching Non-Academic Staff	$12,300
District Personnel	$17,800
Principal	$19,270
Secretary and Clerical Staff	$3,335

a. These salaries are based on the 1972-73 school year.

determined by whether it is used for a summer reading program, then a portion of the capital cost of the building can be justifiably assigned to the summer program. It is difficult to resolve this issue.

Because we were interested in the total resources used in a summer program, we included the complete costs of facilities. However, since they were separately identified, it was possible to examine their impact on effectiveness separately. It was also possible to remove their costs from the total.

The summer reading program cost model assigned a classroom of typical dimensions, approximately 25 x 35 feet, to every class regardless of class size. Thus, for the purposes of the model, the quantity of facilities was equal to 1.0, and the class allocation factor was equal to 1.0. The reading program factor was the same as that used for the class instructor. And the unit cost of this classroom space, including a certain amount of support space in the form of hallways, corridors, staff offices, etc., was $1,500 for a full school year. This included the capital cost of the building amortized over its life and maintenance and operating expenses. A more detailed discussion of the cost basis of facility space can be found in Volume I of this report.

The displayed cost for facility space was equal to $1,500 divided by the number of children in the class. As a result, the cost per pupil for facility space in a particular class was dependent on the number of children in the classroom. If a small class of four or five pupils used a regular classroom, the relative cost for facility space was high compared with a class of 30. However, in most instances, the classes in summer reading programs were uniformly smaller than those during the regular school session.

As pointed out above, the cost assigned to each class for facility space did not vary since it was not based on actual measurement of facility space used. This is justifiable because the relative cost of facility space for different classes is very unlikely to be important in distinguishing effective programs. In fact, as briefly touched on earlier, it is debatable whether the capital costs of facility space should be included in the cost of the summer program at all. However, the primary importance of this cost element is to give meaning to the total cost of the reading programs; that is, to ensure that all cost categories have been included, and that comparisons can be made.

EQUIPMENT MODEL PARAMETERS

Equipment used for instructional purposes was subdivided into five categories:

(1) tape recorders and record players;
(2) teaching machines and technological devices;
(3) movie and filmstrip projectors;
(4) slide, opaque, and overhead projectors; and
(5) television and video equipment.

This breakdown of instructional equipment was useful in the cost analysis during the regular school session programs, and was also used here for convenience and comparability. A more detailed breakdown would unnecessarily dilute the cost of equipment. However, to use no breakdown at all might cloud some of the issues involved.

Generally, we assumed that the use of equipment in the summer programs did not differ significantly from the regular academic term. But several phenomena were observed during the summer site visits. First, it is unlikely that teachers drastically changed their teaching approaches for the summer session. If teachers were accustomed to incorporating instructional equipment into their teaching approaches, they probably did so in the summer also, and if not they probably did not. However, in some cases, teachers made more use of equipment in the summer--primarily in schools where the equipment inventory was small and inaccessible because of the large demand during the regular school year. In still other cases, teachers made less use of equipment in the summer, even though the potential was there to use it more often. This usually occurred in very small classes, where teachers did not find it necessary to use instructional equipment to aid them in providing individualized instruction and to hold the attention of their students, as is often the case in larger classes.

The unit cost for the equipment categories used in the summer reading program cost model is a quantity we call the "often" cost. We chose this name because this cost is equal to the cost allocated to a class for the use of equipment where teachers responded they used that type of equipment often. These figures were taken from regular school year numbers in the same school the summer program was operating. This approach to costing summer equipment resources was felt to be superior to either attributing a zero cost to the summer program for instructional equipment, or attributing a summer cost equivalent for the full inventory of equipment available to the summer session teachers.

Another key factor in the decision to use the concept of an "often" cost was that annual depreciation and operating expenses are a function of time or use. In the ideal situation of extremely high utilization, use may be the sole determinant of the annual cost of equipment; i.e., equipment that is highly utilized would wear out quickly. However, this is not usually the case in school systems. The equipment items generally lie idle for the majority of the day and are used infrequently. Alternatively, however, it is unreasonable to assume the cost of equipment is just a function of its age, because an equipment item that is used in the summer as well as during the regular academic term will have a somewhat shorter life than its counterpart that is not used in the summer. The "often" cost of equipment is the cost (for a class) of using this equipment type during the regular school term. This "often" cost, when multiplied by the summer program length factor, will yield a cost that is equitably attributable to the summer program. Table 7 lists the "often" costs of the five equipment types for the schools operating a summer program. A more detailed discussion of the basis for the unit cost of equipment can be found in Volume I of this report.

The unit cost for an equipment type is a per class cost for those class instructors who indicated they used that equipment type often. Thus, the classroom allocation factor is equal to 1.0 for them, 0.5 for instructors indicating "sometimes," 0.1 for those indicating "rarely," and 0.0 for those indicating "never." The reading program factor is the same as that for the class instructor.

MATERIALS MODEL PARAMETERS

In the summer reading program cost model, four types of materials were considered (similar to the cost analysis of the regular compensatory reading programs). These four types of materials were:

(1) basal readers,
(2) individualized or programmed instruction "kits,"
(3) library books, and
(4) general instructional supplies.

Table 7

"OFTEN" COST OF EQUIPMENT AND MATERIALS[a,b]

School ID	Tape Recorders and Record Players	Teaching Machines and Technical Devices	Movie and Filmstrip Projectors	Slide, Opaque and Overhead Projectors	Video and Television	Basal Texts	Programmed Instruction and Individualized Teaching Materials
5	36.18	19.00	14.63	8.77	7.01	104.22	-
12	54.54	1.16	12.96	.85	23.76	.66	37.35
20	33.69	30.80	66.64	45.36	32.76	73.71	16.52
28	116.64	164.70	12.42	-	-	16.20	-
30	99.71	354.90	20.67	58.26	-	-	4.76
41	37.59	116.44	18.25	23.97	31.88	35.00	-
46,47	23.95	-	24.28	21.10	-	20.23	6.14
71	29.14	86.18	27.20	21.10	-	26.38	112.88
104	58.65	99.40	41.86	13.57	-	58.44	2.45
119	242.70	4[illegible].10	564.00	18.00	-	332.10	24.30
168	-[c]	-[c]	-[c]	-[c]	-[c]	-[c]	-[c]
232	71.74	14.47	55.97	15.90	105.10	48.55	16.91
249	81.98	72.00	42.55	27.86	95.60	97.30	24.00
254	70.26	210.08	47.07	13.20	7.02	53.86	10.84
294	54.04	-	49.24	5.60	53.20	22.95	-
306	105.46	322.50	27.82	59.80	28.70	29.08	-
317	91.56	23.93	71.55	10.21	48.78	34.98	-
359	69.06	-	153.54	14.23	20.82	.30	-
369	91.75	12.69	50.45	17.31	20.90	220.62	26.90
906	25.48	22.46	21.58	9.04	-	-	88.66
908	30.28	-	17.34	12.50	12.39	31.74	10.64
915	67.40	-	24.86	8.08	5.48	72.96	11.46
917	69.17	7.68	42.99	23.95	38.44	-	62.78
922	30.50	19.65	22.14	10.06	-	58.24	-
928	51.20	-	-[d]	21.12	-	11.14	-
Average[e]	68.44	111.34	59.58	19.99	35.46	64.22	30.44
Standard Deviation	45.96	132.60	111.71	15.30	30.05	78.05	32.64

a. The "often" cost for a particular resource is the cost allocated to a class during the regular school session whose instructor indicated he used that resource "often." The cost reflects a full academic year cost.

b. An unfootnoted blank in the table indicates that the resource is unavailable.

c. No class cost information available from regular school session analysis. The average costs are used in the summer reading cost model.

d. Insufficient data available. The average value is used in the summer reading program cost model.

e. Averages and standard deviations are calculated based on nonzero values only.

The cost of these resources was treated in two distinct ways. The first way was similar to the treatment given instructional equipment types; i.e., the use of an "often" cost. This method was applied to basal readers and programmed instruction materials. The second method was to simply use a cost per student, which was uniformly assigned to each student in every class. This method was also used to attribute the cost of library books and general instructional supplies.

As in the case of instructional equipment, the method for treating the cost of various materials categories was difficult to determine. Basal readers and individualized or programmed instructional materials are purchased for use during the regular academic program. Few, if any, materials are purchased specifically for use during the summer program. Thus, one could be justified in assigning a zero cost of materials to the summer program since the cost to the system for using these materials in the summer is zero. The exception, of course, is the general instructional supplies that are consumed.

But we feel that using the "often" cost is highly desirable because it makes the cost analysis of the summer reading programs comparable to that of the regular school term. Furthermore, it does not overburden the summer programs with high costs by distributing the school's entire inventory to the program, which is, of course, unjustified. The inventory size of instructional materials is determined by enrollment levels during the regular school year, not by the substantially smaller enrollment during the summer session. However, by using the "often" cost approach, we escape the trap of applying a zero cost to the summer program.

The "often" cost for basal readers and individualized program materials is the cost of materials for reading per class based on the class instructors responding that they use these types of materials often. Thus, the unit cost for basal readers and for individualized or programmed materials is equal to the "often" cost of that type of material. A more detailed discussion of the basis for determining the cost of materials and allocating them can be found in Volume I of this report.

The cost of library books in the summer reading program cost model is the same figure as the cost of library books in the regular school term cost model. This is the per pupil cost of the library books amortized over their useful life. The displayed cost of library books is the per pupil cost of library books during the regular school term multiplied by the summer program length factor. Also, the per pupil cost of general instructional supplies in the summer reading program cost model is the same figure used in the regular school term cost model. Again, the displayed cost is the cost per pupil for general instructional supplies during the regular school term multiplied by the summer program length factor.

The overall differences in the use of materials between the summer program and the regular term did not appear significant. As in the case of equipment, the amount of materials that could be used was very large during the summer program since the entire regular school term inventory was available. However, we assumed that this did not significantly affect the teacher's use of materials for several reasons. First, teachers are accustomed to using materials in a certain prescribed format as part of their teaching methods. From our site visits, we observed that a teacher's use of materials probably does not change significantly in the summer program. However, one exception should be pointed out. Since it was necessary for the teachers to make school fun for the children--because in most cases attendance was voluntary and because one of the primary objectives of the summer programs was to improve the students' attitudes toward school--only highly motivating and interesting instructional materials were chosen.

The class allocation factor for basal texts and programmed or individualized teaching materials was the use weighting factor. The class allocation factor for general instructional supplies and library books was the number of students in the class. The reading program factor for all materials categories was equal to that for the class instructor.

Several data sources were used to cost materials for the summer reading programs. From the summer site visit reports, we determined if the school library was open and available for use by the summer classes. If the library was not open, a zero cost was assigned. If the library was open, the same cost per student was assigned for the regular school year--adjusted, of course, by the summer program factor. The cost of general instructional supplies was assigned to all classes and was obtained from regular school term data. The class allocation factor of basal readers and programmed instructional materials was dependent on the teachers' responses on the Program and Class Characteristics Questionnaire. If they indicated "often," the use factor was 1.0; if "sometimes," the use factor was 0.5; if "rarely," the use factor was 0.1; and if "never," the use factor was 0.0. Table 7 on page 25 lists the "often" costs of basal texts and programmed instruction or individualized materials for schools operating summer programs.

DISTRICT CENTER MODEL PARAMETERS

Analogous to the cost analysis of the reading programs during the regular school year, two types of district services were included in the resources under consideration. These district services were in the form of district centers that were then subdivided into two types: "student-related," where the services offered by the center were provided directly to the student, and "resource-related," where the services provided by the center were primarily for teachers. Student centers were usually staff-intensive, while resource centers were usually material- and equipment-intensive.

However, no student centers were used by the summer programs. This is true at least in the sense that no student centers were used to supplement the summer programs' instruction. In some cities, the student centers were in operation, but they worked independently of the summer compensatory reading programs. On the other hand, resource-related centers were often operating and available to summer program staff. The summer school teacher's utilization of the resource center was similar to that of a teacher during the regular school year.

The unit cost of the district center services were derived from the cost analysis of the reading programs during the regular school year. Volume I of this report contains a detailed discussion of this computation. The unit cost used for the summer reading program cost model was the cost per student of the district center's services in the subject area of reading. The unit cost was calculated for each school district. These figures are displayed in Table 8.

The total cost of operating the center was divided by the number of schools it served times the average enrollment of these schools to give the cost per student of operating the center. This was further proportioned between reading and other subject areas. The cost per student allocated to reading was the unit cost used in the summer reading program cost model. From the summer site visits, we determined whether these centers were open for the summer staff to use. If they were not, a zero cost was assigned to the summer program. However, if they were open--regardless of how much or how little the summer programs used them--a cost was assigned to the program, adjusted by the summer program length factor.

Table 8

COST PER STUDENT OF MATERIALS AND DISTRICT RESOURCE CENTERS

School ID	Library	General Instructional Supplies	District Resource Centers[a]
5	1.34	.90	-
12	8.42	.61	5.99
20	20.95	.77	-
28	15.22	.90	-
30	7.24	1.09	-
41	13.74	.94	-
46,47	7.74	.76	-
71	12.68	1.05	5.68
119	6.31	.45	.11
108[b]	-	-	-
232	4.48	1.35	18.31
249	9.76	.88	.70
254	2.37	1.09	-
294	9.20	.97	-
306	7.28	.96	-
317	9.03	.99	-
359	12.10	.86	-
369	10.54	1.26	-
906	3.95	1.11	-
908	5.87	1.12	-
915	12.53	.53	-
917	2.70	1.34	9.19
922	5.24	1.15	-
928	8.12	1.32	2.05
Average[c]	8.56	.97	6.00
Standard Deviation[c]	4.60	.24	6.33

a. The district resource center per student costs are reading only.

b. No class cost information available from the regular school session analysis. The average costs are used in the summer reading program cost model.

c. The averages and standard deviations are based on nonzero values only.

Since the unit cost of district centers was a cost per student for providing the services, the class allocation factor was equal to the number of students in the class. The unit cost also reflected the cost of the district center multiplied by the reading program factor determined from the regular school term study. This reading program factor was based on the focus of the resources available in the center. Thus, the reading allocation factor for the purposes of the summer program cost model was equal to 1.0.

SUMMARY

Table 9 presents a general specification of the model calculations and the cost-analysis approach used for each resource item. Summer program classes quite often had mixed grade levels of students in them. Therefore, it was not possible to calculate actual different costs for the instruction of second, fourth, or sixth grade students. However, a representation of these costs can be estimated by calculating weighted averages for instruction in those grades. The weighted average cost of instruction for the second grade is the sum of the products of the number of pupils in the second grade and the cost per pupil in each class divided by the total number of second-grade pupils in those classes. The procedure for calculating the weighted cost per pupil in the fourth and sixth grades is analogous.

Table 9

GENERAL SPECIFICATION OF SUMMER READING PROGRAM COST MODEL VARIABLES FOR EACH RESOURCE ITEM

	Quantity	Classroom Allocation Factor	Reading Program Factor	Unit Cost	Summer Program Length Factor
Class Instructor	1.0	1.0	Class Specific	Experience/Degree Dependent (standardized)	School Specific
Teacher Aide	School Total	Relative Use	Class Specific	$ 2,754 (standardized)	School Specific
Reading Specialist	School Total	a	1.0	12,225 (standardized)	School Specific
Nonteaching Academic Staff	School Total	a	School Average	13,250 (standardized)	School Specific
Nonteaching Non-Academic Staff	School Total	a	School Average	12,300 (standardized)	School Specific
District Personnel	School Total	a	School Average	17,800 (standardized)	School Specific
Principal	School Total	a	School Average	19,270 (standardized)	School Specific
Secretary and Clerical	School Total	a	School Average	3,335 (standardized)	School Specific
Facility Space	1.0	1.0	Class Specific	$ 1,500	
Tape Recorders/Record Players	1.0	b	Class Specific	Often Cost/School Specific	School Specific
Teaching Machines/ Technological Services	1.0	b	Class Specific	Often Cost/School Specific	School Specific
Movie Projector/ Filmstrip Projectors	1.0	b	Class Specific	Often Cost/School Specific	School Specific
Slide/Opaque/Overhead Projectors	1.0	b	Class Specific	Often Cost/School Specific	School Specific
Video and Television	1.0	b	Class Specific	Often Cost/School Specific	School Specific
Basal Texts	1.0	b	Class Specific	Often Cost/School Specific	School Specific
Programmed Instructions and Individualized Teaching Materials	1.0	b	Class Specific	Often Cost/School Specific	School Specific
Library	1.0 or 0.0	c	Class Specific	Per Student Cost/ School Specific	School Specific
General Instructional Supplies	1.0	c	Class Specific	Per Student Cost/ School Specific	School Specific
Resource Centers	1.0 or 0.0	c	1.0	Per Student Cost/ School Specific	School Specific
Student Centers	1.0 or 0.0	c	1.0	Per Student Cost/ School Specific	School Specific

a. Number of students in class divided by school enrollment.
b. Relative use weights.
c. Number of students in class.

3

COST ANALYSIS RESULTS

The summer reading program cost model presented in Chapter 2 was used to estimate the cost per pupil of reading in 59 classes in 25 schools. Also, a weighted cost for grades 2, 4, and 6 in each school was calculated based on the number of students in the respective grades. The results of this exercise of the model are presented in Appendix B. This chapter will introduce the reader to the format of the model outputs and present summary results concerning trends across schools found in the costs of summer programs.

The chapter is organized in three sections. The first describes the model output for a specific school and explains each of the individual cost entries. The second presents summary information on the cost of the special summer reading programs in the 25 schools for which the cost model was exercised. The last section discusses some of the basic model parameters and their distributions. It also addresses the variability in observed costs within our sample of schools and the possible sources of that variation. These cost results will be used to perform a cost-effectiveness evaluation in conjunction with effectiveness measures being developed by ETS.

EXAMPLE MODEL OUTPUT

The summer reading program cost model yields an output for each school to display the results of the resource approach to costing. That output is similar to the one presented in Table 10 for School 41. Please refer to this table for the following discussion.

Table 10

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 41

Class	21	22	42		
Number of Sessions	3	3	3		
Number of Students	11	11	11		
Number in Grade 2	3	4	0		
Number in Grade 4	0	2	3		
				Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade
Resource					
Class Instructor	69.67	69.67	59.84	69.67	63.77
Teacher Aide	3.45	0	6.95	1.49	4.17
Supervision and Coord. Staff	16.05	16.05	16.05	16.05	16.05
Staff Subtotal	89.20	85.72	82.85	87.21	84.00
Facility Subtotal	11.36	11.36	11.36	11.36	11.36
Tape Recorders/Record Players	.14	.28	.03	.22	.13
Teaching Machines	.44	.44	.88	.44	.70
Movie/Filmstrip Projectors	.14	.07	.14	.10	.11
Slide/Overhead/Opaque Project.	.02	.02	.02	.02	.02
Television/Video Tape Players	.02	.02	.02	.02	.02
Equipment Subtotal	.76	.83	1.09	.80	.99
Basal Readers	.13	.13	.03	.13	.07
Library Books	1.14	1.14	1.14	1.14	1.14
Other Supplies and Materials	.08	.08	.08	.08	.08
Materials Subtotal	1.35	1.36	1.25	1.35	1.29
Total Cost	102.67	99.27	96.55	100.72	97.64

All costs in Table 10 are expressed in terms of dollars and the cost per pupil for each resource item or category. Also listed are a few descriptions for the classes being costed in this school. The "Class ID" is simply a code number used to refer to a particular class in the school. Some classes actually represent a particular teacher teaching more than one group of students at different times during the day. When it was impossible to break down this teacher's classes into distinguishable groups of students, all of the students being taught were considered a class. Therefore, the "number of sessions" for this class is the number of different groups or classes this larger concept of a class represents. The "number of students" is simply the total number of students in the class from all grade levels. In the case of a multisession class, it represents the total number of students from all sessions. If one divided the "number of students" by the "number of sessions," the resulting figure would be the average number of students the teacher instructed in any particular session. The number of students in this class who were in grades 2, 4, and 6 is indicated on the next line. Only students from these grade levels were tested in this study.

The resource items under consideration in this cost analysis are listed below the class descriptors or demographic characteristics. Only the resources employed in the school are shown. The resource items are organized into five resource categories: staff, facilities, instructional equipment, instructional supplies, and district centers. For each of these resource categories, there is a separate subtotal, along with the total cost of all the resource items.

In addition, grade average costs are presented. Since effectiveness will probably be determined separately for each grade, the cost analysis results must consider each grade separately. Therefore, performing a cost-effectiveness analysis of the special summer compensatory reading programs requires that costs be available for the grades 2, 4, and 6, individually. Where multigraded classes are the exception rather than the rule during the regular school session, weighted average costs must be calculated for each grade.

The weighted average cost for each grade is calculated by using the following formula:

$$\text{weighted cost grade } i = \frac{\sum_{j=1}^{n} e_{ij} \cdot c_j}{\sum_{j=1}^{n} e_{ij}},$$

where

e_{ij} = the enrollment in grade i in class j,

c_j = the cost per pupil of class j, and

n = the total number of classes in the school with grade i.

Each class is weighted by the number of second-grade students in it. Thus, the weighted average second-grade cost is the average of all classes with second-grade students in them.

SUMMER READING PROGRAM COST RESULTS

This section presents a summary of the summer reading program cost results. Table 11 displays the average cost per pupil of the summer reading programs for each of the resource items and the corresponding resource categories. These average costs were based on only those classes that had a nonzero cost allocated to them for the particular resource. The number of classes that use a particular resource is presented in the middle column of the table. To give an indication of the variability associated with the data, the standard deviations of the calculated costs are displayed in the righthand column. The average total per pupil cost for the summer reading program is $59.83. Of this total, 77.2 percent, or $52.79 was spent for staff; 9.2 percent, or $5.52, was spent for facilities; 1.0 percent, or $1.58 was spent for equipment; 1.3 percent, or $0.80, was spent for materials, and 0.3 percent, or $0.10, was spent on the average for district centers.

The costs discussed above were derived from the cost of each class in the summer reading program cost model output. The costs in Table 12 were derived from the weighted average grade cost columns. The average per pupil costs for grades 2, 4, and 6 are presented for each of the major resource categories. The number in parentheses below the average costs are the associated standard deviations. The proportion of the total cost each resource category represents is indicated below that. For instance, in grade 2, staff costs represent

Table 11

AVERAGE PER PUPIL CLASSROOM COSTS BY RESOURCE ITEM

Resource Item	Average[a] Cost Per Pupil	Number of Classes Using Resource	Standard Deviation
Class Instructor	37.05	59	22.72
Teacher Aide	12.34	21	10.33
Reading Specialist	9.03	9	8.08
Nonteaching Academic Staff	1.62	4	1.67
Nonteaching Non-Academic Staff	1.12	11	.77
Supervision and Coordination Staff	8.62	44	6.13
Staff Subtotal	52.79	59	28.15
Facility Subtotal	5.52	59	3.40
Tape Recorders/Record Players	.25	54	.24
Teaching Machines/Technological Devices	.45	22	.54
Movie/Filmstrip Projector	.17	51	.37
Slide/Opaque/Overhead Projector	.04	47	.04
Video and Television	.01	28	.01
Equipment Subtotal	.58	59	.78
Basal Texts	.19	44	.65
Programmed Instruction Individualized Teaching Materials	.04	27	.05
Library	.77	41	.31
General Instructional Supplies	.09	59	.03
Materials Subtotal	.80	59	.75
Resource-Related District Center			
District Center Subtotal	.49	12	.43
Total Cost	59.83	59	31.88

[a] Average of classes that have a nonzero cost allocated to them except in the case of teacher aides, equipment, and certain materials where the resources may be available but not used by the class and thus have a zero-associated cost.

Table 12

AVERAGE GRADE WEIGHTED COSTS BY MAJOR RESOURCE CATEGORIES[a]
(dollars per student)

		Grade 2	Grade 4	Grade 6	All Classes
Total		56.07 (31.08)	54.28 (29.15)	45.68 (27.82)	59.83 (31.88)
Staff		49.49 (27.80)	48.05 (26.12)	40.56 (25.71)	52.79 (28.51)
	% of Total	.883	.885	.888	.882
Facilities		4.95 (3.20)	4.90 (3.14)	3.86 (2.21)	5.52 (3.40)
	% of Total	.101	.090	.084	.092
Equipment		.72 (1.05)	.37 (.33)	.28 (.30)	.58 (.78)
	% of Total	.013	.007	.004	.010
Materials		.78 (.68)	.83 (.56)	.84 (.62)	.80 (.75)
	% of Total	.014	.015	.018	.013
District Center		.13 (.31)	.12 (.31)	.16 (.37)	.10 (.27)
	% of Total	.002	.002	.004	.002

a. The quantities in parentheses below the average values are the standard deviations.

88.3 percent of all costs, facilities represent 10.1 percent, equipment 1.3 percent, materials 1.4 percent, and district centers 0.2 percent.

SOURCES OF VARIATION

As you can see from Tables 11 and 12, there is a large amount of variation in the observed costs. In this section, we will hypothesize about the possible sources of this variation.

By examining the basic cost model structure shown in Chapter 2, we find three factors that are basically independent of the resources available during the summer program, but that are important in the calculations of the costs. These are f, the factor adjusting for the length of the summer program; p, the proportion of time a resource is used in reading; and n, the number of students in the class.

Before analyzing the distribution of these factors, it is instructive to look at the characteristics of the summer program. Table 13 displays some of the descriptive characteristics. The program focus tends to be remedial, remedial/enrichment, compensatory, or just enrichment. The total program hours, or the number of instructional hours, varies widely from a low of 54 hours to a high of 173 hours, with a mean roughly equal to 96 hours. Student enrollment varies widely also. The enrollment, however, is not necessarily indicative of class size. The ratio of pupils to staff must be examined to get a feel for the intensity of the staff in the program. The lower the student-staff ratio, the more staff-intensive the program is. Also, the grade levels involved could influence the cost of teaching reading since a student's instructional needs change considerably across grades. Table 13 gives an indication of the diversity of the summer programs participating in this study.

Summer Program Length Factor

The unit costs used in the cost model are based on annual capital costs and annual operating and maintenance costs for a particular resource. Thus, these annual costs must be multiplied by the summer program length factor to obtain an equivalent cost for the summer program. If two programs are identical in terms of resources used, but one program is twice as long as the other, then the longer program will be twice as costly as the other. Therefore, the distribution of the costs should be related to the distribution of program length.

Table 13

PROGRAM DESCRIPTORS

School Number	Program Focus	Total Program Hours	Student Enrollment Total	Grades Enrolled	Staff				Staff Training Days	Student Staff Ratio[c]
					Total (FTE)	Teachers (FTE)	Aides (FTE)	Other[a]		
5	Remedial	120	31	1-4	4	1.5	1	2	0	12.4
12	Remedial	54	44	1-6	3	3	--	--	0	14.6
20	Remedial	63	70	1-6	9	7	1	1	2.5	8.7
28	Remedial/Enrichment	60	225	1-6	15	10	4	1	0	16.0
30	Compensatory	90	75	K-7	10	9	--	1	0	8.3
41	Compensatory	90	50	1-8	7	6	--	1	0	8.3
46	Enrichment	100	174	6-7	9	7	--	2	0	24.8
		100	249	K-5	11	9	--	2	0	27.6
71	Enrichment	113	85	K-5	6	4	--	2	0	21.2
99	Remedial/Enrichment	60	116	2-8	10	6	1	3	0	16.5
104	Remedial	75	120	1-6	12	8	--	4	1	15.0
109	Remedial	90	4	1, 4, 6	2	1	1	--	0	2.0
119	Remedial	90	113	K-3	21	6	7	7	2	8.7
168	Remedial	60	106	1-6	11	8	1	2	0	11.8
232	Remedial/Enrichment	90	86	K-6	5	2	--	3	0	43
249	Compensatory	173	40	1-6	1	1	--	--	b	40
254	Remedial/Enrichment	100	205	K-7	15	9	5	1	0	14.6
294	Remedial	120	187	1-9	12	11	--	1	0	17.0
306	Remedial	100	78	K-5	8	6	--	2	b	13.0
317	Remedial/Enrichment	88	143	K-8	17	9	5	3	5	10.2
359	Remedial	98	71	1-6	10	9	--	1	0.5	7.9
369	Remedial	120	76	1-8	9	3	3	3	0	12.7
906	Remedial	160	169	K-6	30	17	10	3	2.5	7.2
908	Remedial	120	42	2-5	3	2	1	--	0	14.0
915	Remedial/Enrichment	80	101	1-8	9	6	--	3	0	16.8
917	Enrichment	107	49	Pre K-2	11	4	4	3	2	6.1
922	Enrichment	107	80	Pre K-2	17	7	7	3	2	5.7
928	Enrichment	80	215	K-6	16	6	9	1	0	14.3

a. Includes principals, psychologists, speech therapists, nurses, and librarians. Expressed as number of individuals.

b. Some staff training was provided for the summer program, but the amount was unreported.

c. The total student enrollment divided by the number of teachers and instructional aides.

Figure 1 presents a histogram of the program lengths. Most of the program lengths are in the neighborhood of the mean, with the exception of some very short and some very long programs.

There are two possible ways to remove the effect of program length on the variability of costs. The first is to divide the cost by the number of instructional hours in the program. This gives the cost per pupil-hour. The second is to divide the cost by the number of weeks the program is in session. This gives the cost per pupil-week, which includes the effect of staff intensity, or the number of hours per week of instruction. The figures for both methods are displayed in Table 14. The cost figures that were transformed are the weighted average total per pupil costs for grades 2, 4, and 6, respectively. From the ratios of standard deviations to means, it can be seen that very little variation was eliminated by removing the effect of program length.

Proportion of Time Devoted to Reading

Several summer programs offered a fairly wide selection of subjects, and the students could choose among them. The majority of the programs, however, consisted of reading, mathematics, and some form of arts and crafts. Still other programs effectively taught reading only. Since the costs from our model are associated with the instruction of reading, the relative intensity of reading instruction in these programs bears heavily on the associated costs. Figure 2 is a histogram of the average school p factor. The largest number of schools (eight) taught reading as one of four subjects; the second largest number (seven) taught only reading.

Number of Students in the Class

There was a definite trend in the summer programs toward smaller class sizes. And, with smaller class sizes, the costs per pupil will necessarily rise.

Since class size was often reported as the total number of students that a particular teacher instructed, a new variable called the effective class size was defined. This variable is equal to the total number of students that a teacher instructed divided by the number of sessions taught a day. For example, a teacher may teach reading to a total of 32 students in four one-hour sessions. In that case, the average number of pupils in each session would be eight, which is the effective class size.

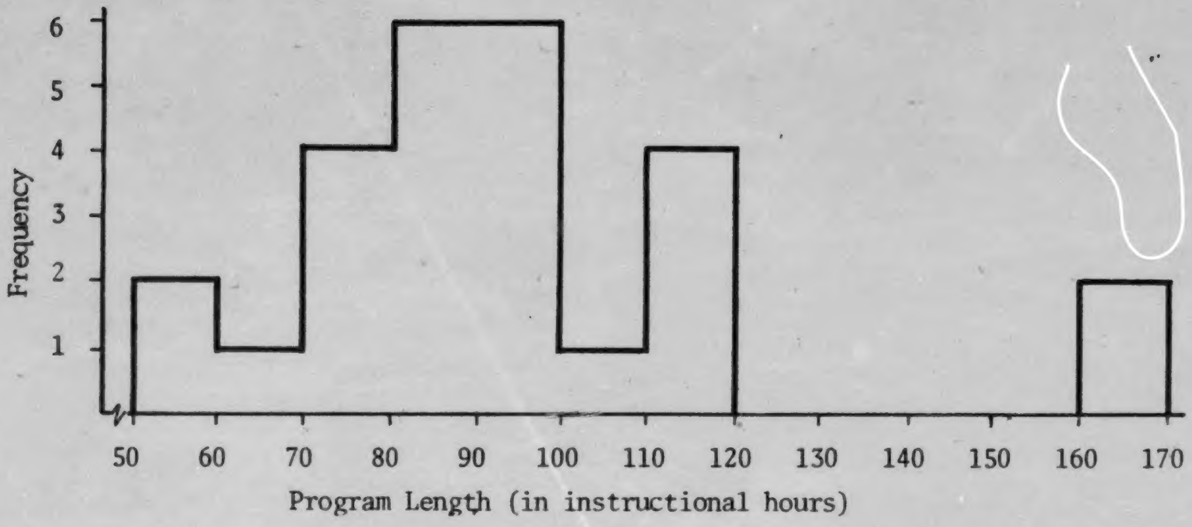

Figure 1: DISTRIBUTION OF PROGRAM LENGTH

Table 14

DISTRIBUTION OF TOTAL COST WITH EFFECT OF PROGRAM LENGTH REMOVED

School ID	Total Cost								
	Per Pupil			Per Pupil-Week			Per Pupil-Hour		
	2	4	6	2	4	6	2	4	6
5	56.36	77.45		9.39	12.91		.49	.68	
12	24.44	30.04	23.39	6.11	7.51	5.86	.41	.50	.39
20	56.44	56.27	68.43	11.29	11.25	13.69	.90	.90	1.09
28	24.75			6.19			.41		
30	57.19	32.99	33.00	9.53	5.50	5.50	.66	.38	.38
41	100.72	97.64		16.79	16.27		1.12	1.08	
46			12.53			2.51			.13
47	12.03	15.13		2.41	3.03		.12	.15	
71	36.52	33.74		7.30	6.75		.34	.31	
104	59.55	64.67		11.91	12.93		.68	.73	
119	109.87			18.31			1.26		
168	39.26	39.05	39.05	7.85	7.81	7.81	.50	.50	.50
232	50.24	51.33	51.33	8.37	8.55	8.55	.67	.68	.68
249	50.42	50.42	50.42	8.40	8.40	8.40	.29	.29	.29
254	12.01	13.03	13.03	2.40	2.61	2.61	.13	.14	.14
294	78.60	88.76		13.10	14.79		.66	.74	
306	96.76	98.81		19.35	19.76		1.00	1.03	
317	24.60	17.47		4.92	3.49		.29	.21	
359	126.72			21.12			1.35		
369	71.26	78.00	78.00	11.88	13.00	13.00	.59	.65	.65
906	92.33	106.44	106.44	11.54	13.31	13.31	.57	.66	.66
908	61.88	61.72		10.31	10.28		.53	.53	
915	45.19	45.23	45.23	11.30	11.31	11.31	.59	.60	.60
917	51.97			8.66			.53		
922	48.77			8.13			.54		
928	13.88	27.33	27.33	3.47	6.83	6.83	.18	.36	.36
Average	60.07	54.28	45.68	10.00	9.81	8.28	.59	.56	.49
Standard Deviation	30.96	28.41	26.64	4.84	4.48	3.75	.32	.26	.26
Ratio[a]	.52	.52	.58	.48	.46	.45	.54	.46	.53
Average All Grades	55.01			9.57			.56		
Standard Deviation	29.71			4.55			.28		
Ratio	.54			.48			.50		

a. This ratio is equal to the standard deviation divided by the mean of the distribution.

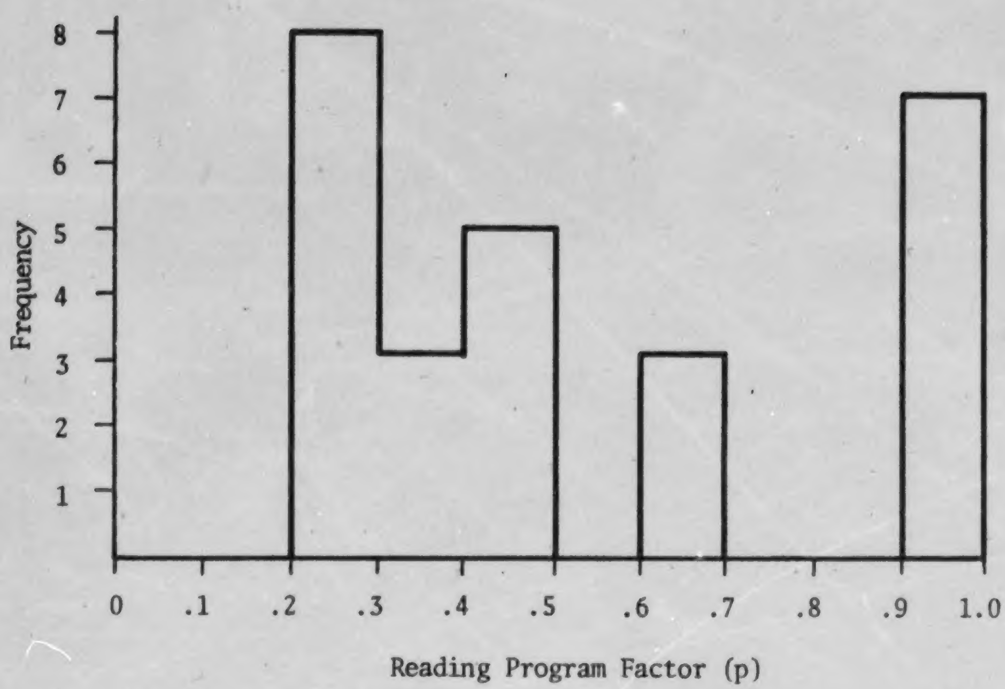

Figure 2: DISTRIBUTION OF PROPORTION OF TIME SPENT IN READING

Figure 3 is a histogram of the effective class size. As you can see from the distribution, half (30) of the total number of classes (59) had effective class sizes of less than 10. A relatively small number were as large as the typical class size during the regular school year, which was roughly 24.

Summary

The factors discussed here can greatly affect costs and their distribution since they relate the available resources in the schools to those that were actually used. It was surprising to find that eliminating the effect of program length from the total cost did not appreciably affect the distribution. However, effective class size and proportion of time devoted to reading can heavily influence the large variation of costs found in the summer programs. This is especially true if the schools that offer many subjects other than reading have large effective class sizes and the schools that offer only reading have very small effective class sizes. For example, large class sizes tend to occur in schools where reading is taught a small proportion of the time. Similarly, small class sizes tend to occur in schools where reading is taught all the time. As a result, the difference in costs between the reading programs is exaggerated.

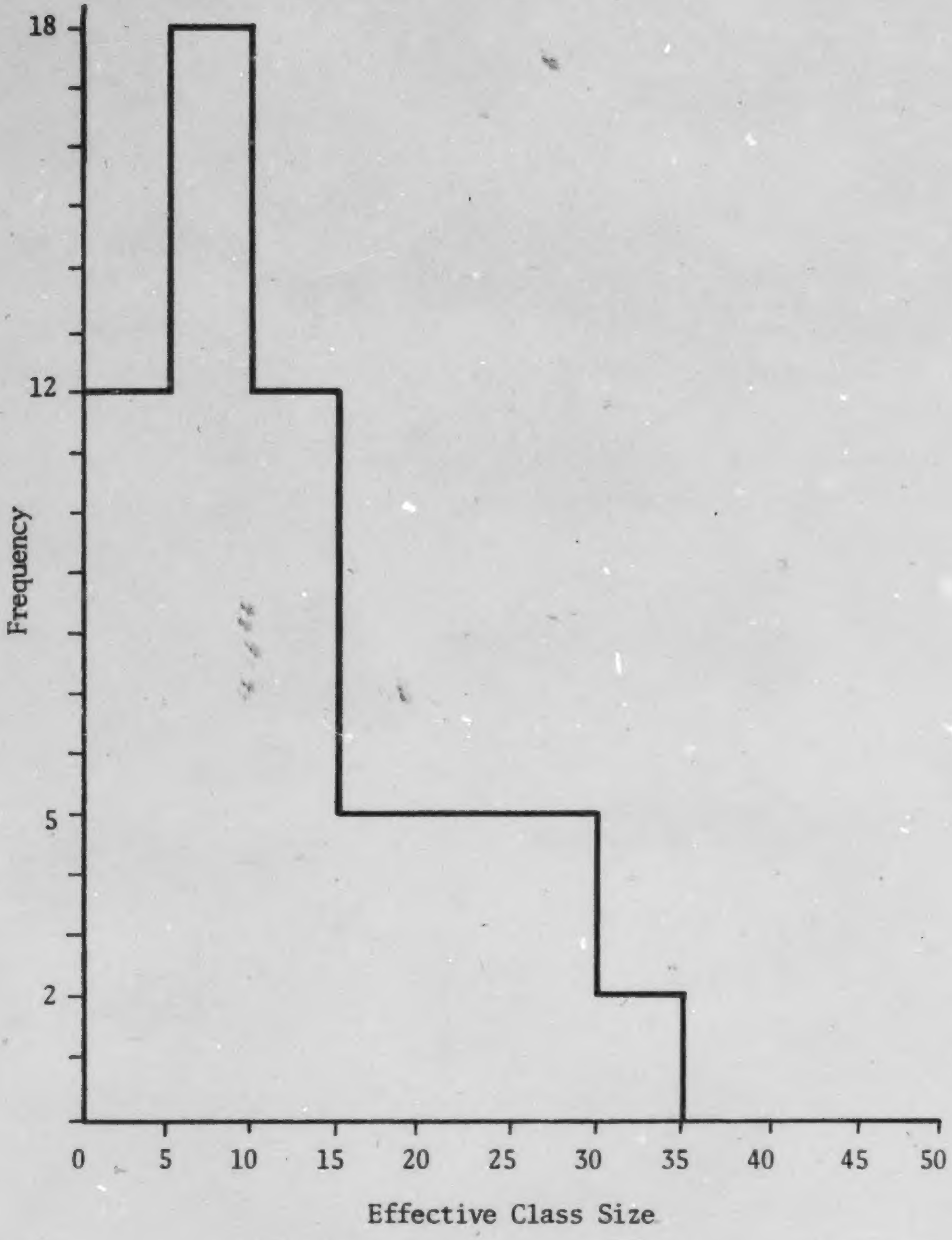

Figure 3: DISTRIBUTION OF EFFECTIVE CLASS SIZE

4

ANALYSIS OF COST RESULTS

In Chapter 3, the results of the cost model were presented along with some summary data on the special summer compensatory reading programs. We also went one step further and discussed some of the possible sources of variability in the summer program costs. In this chapter, we will go into more detail about variability within the cost results. We will also make comparisons between the regular session and the summer session. Finally, we will test the conclusions from the regular session cost analysis to see if they held true during the summer session.

This chapter is organized into two basic sections. The first section deals with an analysis of the variance (ANOVA) between and within certain stratifications of the summer school classes. This statistical procedure will test whether certain gross descriptors of the classes seem to have a bearing on cost. The second section makes comparisons between the regular school session and summer session and sets forth hypotheses to explain the differences that exist.

ANALYSIS OF VARIANCE

Because of the large variation associated with the cost of summer reading classes, we conducted an analysis of variance to determine if the variability could be explained by stratification and if the differences between the means of these strata were statistically significant. We conducted four such analyses to investigate the mean costs between schools, funding sources, program thrust, and grade levels. For simplicity, only the major cost categories and the class instructor were examined.

Two measures result from such an analysis of variance: The F test and the R^2 test. The F test is calculated as the ratio of the amount of variation between classes that can be explained by grouping the classes in a particular way (such as by funding source) to the amount of variation that cannot be explained by this grouping. Obviously, as this ratio becomes greater, it is more likely that differences between group means are statistically significant and do not result from random sample errors. At a critical value of this ratio, as determined from an F distribution[1] and the degrees of freedom, the likelihood of the means not being significantly different becomes remote. In this study, the critical value is the ratio for which this probability is 0.05. Called the 0.05 significance level, it means that the difference between the means will be due to random sample error in only 5 percent of the cases examined. Above the critical value, the differences between the means are considered statistically significant.

The R^2 statistic, called the coefficient of determination, measures the strength of the differences between group means. It is calculated as the ratio of the explained variation, divided by the total observed variation. The higher this ratio, the higher the likelihood of being able to predict the cost of a program by determining in which group it is located. In the analysis of reading program costs, the R^2 statistic measures the proportion of the total variation in program costs that is explained by the program groups. As an example, suppose that two groups of class costs with statistically significant different means are being considered. A high R^2 would mean that a school from the group with the higher mean would very likely have a high cost because there is a sharp division between the cost of the two groups. Conversely, a low R^2 would mean that such a school from the high cost group could have a low cost. This is because the division is not sharp between the two groups, and the distributions overlap.

ANOVA Between and Within Schools

The first analysis of variance performed was designed to investigate the differences between the cost of classes within a school and the differences between the cost of classes across schools. The results of this ANOVA are presented in Table 15.

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[1] Dixon and Massey, Introduction to Statistical Analysis (McGraw-Hill, 1957).

Table 15

ANALYSIS OF VARIANCE ACROSS AND WITHIN SCHOOLS[a]

	F Test[b]	R^2 Test
Total Cost	30.3378[c]	.958
Class Instructor	18.6241[c]	.934
Staff	27.7956[c]	.955
Facility	59.3974[c]	.978
Equipment	9.9027[c]	.882
Materials	1.8638[c]	.581

a. As a result of the volume that would be inherent in this table if the means and standard deviations were included for all schools, they have been eliminated.

b. Degrees of freedom are 25 and 33.

c. Significant differences at the 0.05 level between school costs.

The variation in cost across schools, as shown in Table 15, is much greater than the variation of costs within schools, with very high F test values in all cost categories except materials. There are also very high R^2 values for all cost categories except materials. The results of the ANOVA corroborate the findings in the regular school session cost analysis, and indicate that future cost analysis does not need to be performed at the class level. It could just as well be conducted at the school level since the variation between school averages accounts for 90 percent of the variability between classes for most resource categories. However, for cost-effectiveness evaluation, analysis at the class level would be useful.

ANOVA of Program Thrust

The second analysis of variance was designed to test the hypothesis that different program thrusts have a strong influence on the cost of the reading program. The results of this ANOVA are presented in Table 16.

Four categories of program thrust were defined. During the site visits conducted to the summer programs, the interviewer--after consultation with the principal or similar program administrator--classified the program thrust as remedial, enrichment, remedial/enrichment, or compensatory. Remedial implies the program was designed to help children who were falling behind. Enrichment implies the program was primarily for the enjoyment of the students and its primary objectives were to encourage the students' enjoyment of school and to improve their self-concepts. However, enrichment programs generally provided remedial instruction in the basic academic subjects (normally reading and mathematics) if the students needed it. Remedial/enrichment implies that aspects of both were used. Compensatory is similar to remedial, but with more emphasis on helping disadvantaged children. Several programs were on the boundaries between categories, but they were assigned to the thrust category the interviewer felt was dominant.

Table 16 reveals that significant differences occurred in the total costs as well as the class instructor, staff, and facilities costs. The costs of classes with a remedial or compensatory thrust were significantly higher than classes with an enrichment or remedial/enrichment thrust. From this, a hypothesis can be formed that typical summer school programs with enrichment or remedial/enrichment thrusts were significantly less costly (since attendance was strictly voluntary) than remedial and compensatory programs that relied on

Table 16

ANALYSIS OF VARIANCE ACROSS AND WITHIN PROGRAM THRUST[a]

	Remedial	Enrichment	Remedial/Enrichment	Compensatory	F Test[b]	R^2 Test
Total Cost	74.90 (27.79)	30.08 (16.23)	31.71 (16.25)	67.44 (31.28)	12.48[c]	.405
Class Instructor	48.13 (19.04)	12.69 (5.15)	13.80 (6.01)	49.52 (17.65)	20.8719[c]	.532
Staff	66.08 (25.51)	27.18 (15.20)	28.55 (15.52)	57.89 (27.25)	11.178[c]	.379
Facilities	7.12 (2.67)	1.82 (.85)	2.21 (.99)	7.49 (3.73)	19.67[c]	.518
Equipment	.78 (.90)	.22 (.20)	.18 (.17)	.95 (.72)	2.9205	.137
Materials	.91 (.92)	.64 (.26)	.49 (.30)	1.10 (.42)	1.3574	.069
Sample Size	33	10	9	7		

[a] The quantities in parentheses below the average values are the standard deviations.

[b] Degrees of freedom are 3 and 55.

[c] Significant differences at the 0.05 level between the cost of classes with different program thrusts.

small numbers of students and individualized instruction to improve student performance.

ANOVA of Funding Source

The third analysis of variance investigated the differences in the costs of programs with ESEA Title I funding and those that did not receive ESEA Title I funding. The results of this ANOVA are presented in Table 17.

Significant differences are seen in the total costs as well as the class instructor, staff, and facility costs between classes with ESEA Title I funding and those without it. This substantiates the hypothesis that ESEA Title I funding is used for purposes over and above what a school district normally purchases. The cost of summer reading classes with ESEA Title I funding were, on the average, 77 percent more expensive than those without ESEA Title I funding. During the regular school session, programs totally funded by ESEA Title I were, on the average, 85 percent more expensive and programs partially funded by ESEA Title I were 35 percent more expensive than programs without this supplemental funding.

ANOVA of Grades Costs

The previous three ANOVAs used class costs as the observations. The last analysis of variance examined the differences between grades. The results of this ANOVA are presented in Tables 18 and 19.

The observations in this case are the weighted average grade costs for each school that were derived from the class costs in the school. The formula for calculating the weighted average grade costs is presented on page 36. No significant differences are seen in the costs for the various grade levels. This is probably caused by the high variation of costs between schools. However, the mean cost values for grade 6 were usually lower than those for grades 2 and 4. There seems to be a trend of lower costs in the upper grades as a result of larger classes and less time spent in reading. Nevertheless, these differences are not statistically significant because of the large variations in costs within each grade. The variation within each grade is due to the variation among schools, program thrusts, and funding types. For the ANOVA presented in Table 19, the sample was initially stratified into schools with and without ESEA Title I funding. The ANOVA of these two subsamples was conducted separately, and still no significant differences between grades appeared. In conclusion, it appears that differences between grades are not as strong as other determinants of variation in the sample.

Table 17

ANALYSIS OF VARIANCE ACROSS AND WITHIN FUNDING SOURCE[a]

	Title I (average)	Non-Title I (average)	F Test[b]	R^2 Test
Total Cost	70.21 (30.93)	39.59 (23.15)	15.1847[c]	.210
Class Instructor	42.70 (21.94)	26.02 (20.47)	7.9887[c]	.123
Staff	62.15 (27.81)	34.54 (20.10)	15.5061[c]	.214
Facility	6.58 (3.34)	3.44 (2.46)	13.7529[c]	.194
Equipment	.69 (.88)	.42 (.49)	1.5795	.027
Materials	.74 (.44)	.99 (1.10)	1.5401	.026
Sample Size	39	20		

a. The quantities in parentheses below the average values are the standard deviations.

b. Degrees of freedom are 1 and 57.

c. Significant differences at the 0.05 level between cost of classes with Title I and non-Title I funding.

Table 18

ANALYSIS OF VARIANCE ACROSS AND WITHIN GRADE[a]

	2	4	6	F Test[b,c]	R^2 Test
Total Cost	56.07 (31.08)	54.28 (29.16)	45.68 (27.82)	.5119	.019
Class Instructor	33.03 (21.13)	34.06 (20.96)	29.41 (20.95)	.1913	.007
Staff	49.49 (27.79)	48.05 (26.12)	40.56 (25.71)	.4700	.017
Facilities	4.95 (3.20)	4.90 (3.15)	3.86 (2.21)	.6014	.022
Equipment	.72 (1.06)	.37 (.33)	.28 (.30)	1.9244	.067
Materials	.78 (.68)	.83 (.56)	.84 (.62)	.0593	.002
Sample size	25	20	12		

a. The quantities in parentheses below the average values are the standard deviations.

b. Degrees of freedom are 2 and 54.

c. There are no significant differences at the 0.05 level between the cost of classes at the various grade levels.

Table 19

ANALYSIS OF VARIANCE
ACROSS AND WITHIN GRADE[a]
(stratified by funding source)

		2	4	6	F Test[b,c]	R^2 Test
Title I	Total Cost	67.64 (29.96)	63.60 (29.88)	54.49 (29.75)	.42	.02659
	Staff	59.97 (26.85)	56.05 (27.04)	48.75 (28.41)	.38	.02365
	Sample Size	16	12	6		
Non-Title I	Total Cost	35.50 (21.72)	40.29 (23.07)	36.88 (25.13)	.09	.00933
	Staff	30.88 (18.89)	35.80 (20.44)	32.37 (22.05)	.13	.01273
	Sample Size	9	8	6		

a. The quantities in parentheses below the average values are the standard deviations.

b. Degrees of freedom are 2 and 31 for the Title I strata and 2 and 20 for the non-Title I strata.

c. There are no significant differences at the 0.05 level between the cost of classes at various grade levels for either the Title I or the non-Title I strata.

Summary

In summary, the following conclusions can be made from the results of the analyses of variance:

(1) The strongest source of variation between schools is determined by different utilized resources, different program lengths, different student-staff ratios, etc. The R^2 associated with this source of variation confirms the hypothesis that future cost analyses can be performed at the school level without loss of significant variation.

(2) Other significant differences in class costs occur between ESEA Title I funded programs and those without ESEA Title I funding and between programs with a remedial/compensatory thrust and those with a more traditional remedial/enrichment thrust.

(3) The cost of ESEA Title I funded classes are, on the average, 77 percent more expensive than classes without ESEA Title I funding.

(4) The cost of classes with a remedial/compensatory thrust are over 100 percent more expensive than classes with a remedial/enrichment thrust.

REGULAR AND SUMMER SESSIONS CONTRASTS

In this section, we will make comparisons between the regular school session cost analysis results and those for the summer school session. We will explore some of the possible explanations for differences in the cost results. The summer session and regular school session are quite different in many respects and care must be taken in drawing conclusions from the differences. The regular school session is operated on a more massive scale in terms of enrollment, weeks per session, hours per day, number of subjects taught, etc. The summer session has voluntary attendance and a relaxed atmosphere. It is shorter both in terms of weeks and hours per day. The number of subjects taught is fewer, etc. In the following paragraphs and tables, we will make two types of comparisons. The first will be comparison of the resource mix of the summer and regular session compensatory classes. The second will be comparison of the cost per student, cost per student-week, and cost per student-hour for the two sessions. None of these figures are strictly comparable between the regular and summer sessions because of the marked differences in the organization of the two sessions.

Resource Mix Comparisons

Tables 20, 21, and 22 display the proportion of the total cost in the major resource categories for the regular and summer sessions. Table 20 presents this breakdown for all classes. Table 21 presents this breakdown

Table 20

PERCENTAGE OF TOTAL COST BY RESOURCE CATEGORY FOR ALL CLASSES

	Regular[a] Session	Summer Session
Staff	69.1	87.7
Facilities	21.3	9.2
Equipment	1.7	0.9
Materials	5.9	1.9
District Centers	1.9	0.4

a. The regular session figures are based on compensatory class costs only.

Table 21

PERCENTAGE OF TOTAL COST BY RESOURCE CATEGORY FOR EACH GRADE LEVEL

	Regular Session[a]			Summer Session		
	2	4	6	2	4	6
Staff	69.2	68.8	70.0	88.3	88.5	88.8
Facilities	21.7	25.5	20.2	8.8	9.0	8.4
Equipment	1.7	1.7	1.8	1.3	0.7	.6
Materials	5.4	6.1	6.0	1.4	1.5	1.8
District Centers	2.0	1.8	1.9	0.2	0.3	0.4

a. The regular session figures are based on compensatory class costs only.

Table 22

PERCENTAGE OF TOTAL COST BY RESOURCE CATEGORY BY FUNDING SOURCE

	Regular Session[a]		Summer Session	
	Title I[b]	Non-Title I	Title I	Non-Title I
Staff	70.2	65.1	88.5	87.2
Facilities	21.8	21.0	9.4	8.7
Equipment	1.7	1.9	0.9	1.1
Materials	4.6	7.2	1.1	2.5
District Centers	1.7	4.7	0.1	0.5

a. The regular session figures are based on compensatory class costs only.

b. Title I is the weighted average of total Title I and partial Title I funding.

for each of grades 2, 4, and 6 in both the regular and summer sessions. Table 22 presents this breakdown for ESEA Title I funded classes for both sessions.

In examining these tables, significant differences in the distribution of costs between major resource categories for the regular and summer sessions are seen. This is particularly true for staff and facilities costs. The average percentage staff cost is 87.7 percent for the summer session and 69.1 percent for the regular session. The average percentage facility cost is 9.2 percent for the summer session and 21.3 percent for the regular session. The percentage of the total cost that the staff plus facility costs represents is 96.6 percent for the summer session and 90.4 percent for the regular session. In other resource categories, the summer session percentages are smaller.

Table 21 shows that the distribution of costs does not change significantly between grades either for the summer or regular sessions. In Table 22, there is a slight tendency for ESEA Title I funded programs--both in the regular and summer sessions--to show higher percentages of staff and facilities costs than programs without ESEA Title I funding. By contrast, the ESEA Title I funded programs reveal lower percentages for equipment, materials, and district services than programs without ESEA Title I funding. One must remember, however, that ESEA Title I funded classes are significantly more costly in absolute dollars than classes without ESEA Title I funding. Furthermore, the smaller percentages of total costs devoted to equipment, materials, and district services actually represent nearly equal costs per student. Also, the somewhat higher proportion of the total costs devoted to staff and facilities is actually a significantly large dollar cost per student. From this evidence, a reasonable hypothesis can be made about one of the causes for significantly higher costs among ESEA Title I funded classes. And that is the significantly smaller ESEA Title I class sizes drive the per student costs up for fixed resources such as the classroom and class instructor, but the per student costs of items such as instructional materials and equipment stay relatively the same.

The major item of note in Tables 20, 21, and 22, is the extremely high proportion of total costs that staff members represent in the summer. This is at least partially caused by the average class size of 12.48 in the summer versus 25.34 during the regular session.

Dollar Cost Comparisons

To simplify the dollar cost comparisons in the next few paragraphs, we will only use the cost of the class instructor and total costs.

All costs from the regular session cost analysis as well as the current cost analysis are expressed in the form of cost per student. However, the per student cost for the summer program should be substantially smaller than the regular school program because of the much shorter duration of the summer program. Therefore, we have defined two new costs to make comparisons easier. The first is the cost per student-week. For the regular session, this is simply the per student cost divided by 36, which is the typical length of the regular session in weeks. This calculation is the same for all strata of the regular session. For the summer session, the calculation is similar except the average weekly length of the sessions varies between 5 and 6 weeks, depending on the strata being considered. The second new cost variable is the cost per student-hour. For the regular session, this is simply the average per student cost divided by 1,080 (the typical number of instructional hours during the regular school year). For the summer session, it is the average per student cost divided by the average program length (in instructional hours) of those programs in the strata under investigation.

Tables 23, 24, and 25 display the average per student, per student-week, and per student-hour costs for the regular and summer sessions as well as their ratios. Table 23 presents these data for all classes; Table 24 for each of grades 2, 4, and 6; and Table 25 for classes with and without ESEA Title I funding.

As in the resource mix analysis, the effects of the different stratifications of the classes are not nearly as significant as the differences between the regular and summer sessions. The regular school session is composed of 1,080 instructional hours versus the average of 96 for the summer programs in our study. Thus, the summer session is 9 percent the length of the regular school session in terms of instructional hours. On an instructional week basis, the summer session is about 14 percent of the regular session since the regular session is 36 weeks long and the average summer length is about 5 weeks. If the costs of programs are proportional to their relative lengths, then the summer session should be between 9 and 14 percent of the total cost. However, its cost is actually 23 percent of the cost of the regular session. Therefore, on the basis of either instructional weeks or

Table 23

COMPARISON OF REGULAR AND SUMMER SESSION COSTS (ALL CLASSES)

		Regular Session[a]	Summer Session	Ratio
Class Instructor Cost	per student	107.01	32.63	.30
	per student-week	2.9725	6.0169	2.02
	per student-hour	.0991	.3379	3.41
Total Cost	per student	238.79	55.01	.23
	per student-week	6.63	9.57	1.44
	per student-hour	.22	.56	2.54

[a] The regular session figures are based on compensatory class costs only.

Table 24

COMPARISON OF REGULAR AND SUMMER SESSION COSTS (BY GRADE)

			Regular Session[a]	Summer Session	Ratio
2	Class Instructor Cost	per student	112.93	33.03	.29
		per student-week	3.14	6.07	1.93
		per student-hour	.1046	.3425	3.27
	Total Cost	per student	247.06	56.07	.23
		per student-week	6.86	10.31	1.50
		per student-hour	.2288	.5814	2.57
4	Class Instructor Cost	per student	118.21	34.06	.31
		per student-week	3.01	6.43	2.14
		per student-hour	.1002	.3437	3.43
	Total Cost	per student	236.81	54.28	.23
		per student-week	6.58	10.24	1.56
		per student-hour	.2193	.5477	2.50
6	Class Instructor Cost	per student	102.10	29.41	.29
		per student-week	2.84	5.52	1.94
		per student-hour	.0945	.3032	3.21
	Total Cost	per student	235.09	45.68	.19
		per student-week	6.53	8.57	1.31
		per student-hour	.2177	.4709	2.16

a. The regular session figures are based on compensatory class costs only.

Table 25

COMPARISON OF REGULAR AND SUMMER SESSION COSTS (ALL CLASSES) BY FUNDING SOURCE

			Regular Session[a]	Summer Session	Ratio
Title I[b]	Class Instructor Cost	per student	127.27	42.70	.34
		per student-week	3.53	7.51	2.12
		per student-hour	.1178	.4238	3.50
	Total Cost	per student	272.29	70.21	.26
		per student-week	7.56	12.34	1.63
		per student-hour	.2521	.6969	2.76
Non-Title I	Class Instructor Cost	per student	72.13	26.02	.36
		per student-week	2.00	5.20	2.60
		per student-hour	.0668	.2894	4.33
	Total Cost	per student	163.20	39.59	.24
		per student-week	4.53	7.92	1.75
		per student-hour	.1511	.4404	2.91

a. The regular session figures are based on compensatory class costs only.

b. Title I is the average of total Title I and partial Title I funded classes for the regular session.

hours, the summer compensatory reading programs are substantially more costly than those during the regular session.

On an instructional hour basis, the total per student-hour cost is consistently over twice as large for the summer program. The class instructor per student-hour cost is consistently over three times as large for the summer program. Smaller class sizes, more highly qualified staff (in terms of education and experience), and a larger proportion of time devoted to reading are the reasons. On an instructional week basis, the summer program has, on the average, a 44 percent greater total per student-week cost and a 102 percent greater class instructor per student-week cost.

Although some differences in the ratios of the summer to regular session costs across grades and between classes with and without ESEA Title I funding do appear, these differences do not change the trend of the summer programs' much costlier nature. For instance, it can be seen that the cost of sixth-grade classes declines relatively more rapidly for the summer session, and thus the ratios of the summer to regular session costs decline somewhat from the average. In conclusion, the higher per student-hour and per student-week costs of the summer program give an indication of its completely different emphasis, instructional techniques, scope, and thus cost.

5

ANALYSIS OF COSTS AND OVERALL EFFECTIVENESS

Educational Testing Service categorized schools with summer programs into three general groups of effectiveness: above average, average, and below average. The effectiveness measure was based on pre- and post-test scores of second- and fourth-grade students on the reading subtest. In addition, schools were only included if complete spring-summer reading subtest data were available.

This chapter presents the results of RMC's analyses of cost and selected summer reading program data relative to the ETS effectiveness categories. In these analyses, RMC determined whether significant relationships existed between the resource levels used in the summer programs and the effectiveness categories developed by ETS. Separate analyses were conducted for the second and fourth grades. As discussed in Chapter 4, the primary analytical technique used by RMC in making comparisons and determining significance was analysis of variance (ANOVA); t-test comparisons were also made.

This chapter is organized as follows:

- the analysis of variance when the schools are stratified by level of effectiveness,
- the analysis of variance when the schools are stratified by both level of effectiveness and type of program, and
- the t-test comparison of above- and below-average schools.

Within each of the analysis sections, the results for schools having summer programs for second-grade students are presented first, followed by the results for schools with fourth-grade programs.

ANALYSIS OF VARIANCE--LEVELS OF EFFECTIVENESS

ETS obtained complete spring-summer reading subtest data from 22 schools having summer programs for second-grade students and 17 schools with summer programs for fourth-grade students. ETS classified the schools as shown below:

Effectiveness Category	Number of Schools Second Grade	Number of Schools Fourth Grade
Above average	3	2
Average	16	13
Below average	3	2
Total	22	17

Since differences were present in the various costs per student and the program/school characteristics among schools with summer programs, RMC conducted an analysis of variance to determine if the differences could be explained by the level of effectiveness. In other words, we wanted to see if the differences between the means of the effectiveness strata were statistically significant. Analyses were conducted for the following costs and program/school characteristics:

Costs

- Total cost per student
- Class instructor cost per student
- Staff cost per student
- Facility cost per student
- Equipment cost per student
- Materials cost per student
- Total cost per pupil-hour

Program/School Characteristics

- Program length (instructional hours)
- Number of second- or fourth-grade students
- Number of second- or fourth-grade students per session
- Total number of students in second- or fourth-grade classes
- Total number of students per session
- Total school enrollment
- School student-staff ratio

Results for Second Grade

Tables 26 and 27 present the analysis of variance results for schools having summer programs for second-grade students. Table 26 shows the results for the cost variables, and Table 27 addresses the program/school variables. The F test was made at the 0.05 level of significance.

Table 26

GRADE 2: ANALYSIS OF VARIANCE OF COSTS ACROSS AND WITHIN EFFECTIVENESS CATEGORIES[a]

	Above-Average Schools	Average Schools	Below-Average Schools	F Ratio[b]	R^2
Total Cost per Student	91.95 (46.40)	51.73 (27.27)	51.82 (4.07)	2.57	.21
Class Instructor Cost per Student	48.63 (34.79)	33.65 (19.41)	20.18 (6.32)	1.42	.13
Staff Cost per Student	81.25 (42.15)	45.04 (24.03)	47.41 (3.35)	2.25	.19
Facility Cost per Student	7.87 (4.55)	5.08 (3.06)	3.25 (1.48)	1.68	.15
Equipment Cost per Student	2.12 (2.59)	.59 (.64)	.26 (.15)	3.29	.26
Materials Cost per Student	.22 (.29)	.94 (.78)	.46 (.32)	1.65	.15
Total Cost per Pupil-Hour	1.04 (.47)	.53 (.27)	.70 (.18)	4.13[c]	.29
Sample Size	3	16	3		

a. Standard deviations are displayed in parentheses below the means.

b. Degrees of freedom are 2 and 19. Differences are significant at the 0.05 level for values in excess of 3.52.

c. Significant differences at the 0.05 level in the average values across the effectiveness categories.

Table 27

GRADE 2: ANALYSIS OF VARIANCE AND PROGRAM/SCHOOL CHARACTERISTICS ACROSS AND WITHIN EFFECTIVENESS CATEGORIES[a]

	Above-Average Schools	Average Schools	Below-Average Schools	F Ratio[b]	R^2
Program Length in Instructional Hours	82.67 (20.03)	99.81 (28.36)	86.67 (22.19)	.70	.04
Second-Grade Students	13.00 (8.18)	13.69 (6.89)	11.33 (8.50)	.39	.04
Second-Grade Students per Session	9.67 (8.96)	5.79 (4.12)	11.33 (8.50)	1.71	.15
Total Students in Second-Grade Classes	15.67 (4.04)	34.06 (22.06)	20.00 (7.55)	1.50	.14
Total Students per Session	12.33 (7.50)	12.76 (8.18)	20.00 (7.55)	1.07	.10
Total School Enrollment	96.67 (22.50)	102.50 (65.06)	76.33 (11.93)	.25	.03
School Student-Staff Ratio	9.47 (2.06)	15.24 (7.91)	19.13 (20.72)	.76	.07
Sample Size	3	16	3		

a. Standard deviations are displayed in parentheses below the means.

b. Degrees of freedom are 2 and 19. Differences are significant at the 0.05 level for values in excess of 3.52.

c. Significant differences at the 0.05 level in the average values across the effectiveness categories.

A review of the two tables reveals that the total cost per pupil-hour (shown in Table 26) is the only variable with significant differences between the means. The R^2 statistic (coefficient of determination) for the cost per pupil-hour is 0.29, indicating that the proportion of the total variation in the costs per pupil-hour explained by the effectiveness groupings (above average, average, below average) is 29 percent. Thus, the strength of the differences between the group means is moderate. Although statistically significant, this result is essentially useless as a predictor of program effectiveness since below-average schools have higher costs per pupil-hour than average schools.

Results for Fourth Grade

The analysis of variance results for schools with summer programs for fourth-grade students are presented in Table 28 for the cost variables and in Table 29 for the program/school variables. Again, the F test was made at the 0.05 level of significance.

Materials cost per student is the only variable that shows significant differences between the means. The R^2 is 0.52, which is reasonably high and means that 52 percent of the total variation in materials cost per student is explained by the effectiveness groupings. However, since materials cost per student alone cannot be considered a major measure of educational input, this result has little usefulness for predictive or explanatory purposes.

ANALYSIS OF VARIANCE--LEVELS OF EFFECTIVENESS AND TYPES OF PROGRAMS

Next, RMC conducted a type of two-way classification analysis of variance. In this analysis, we wanted to determine whether significant differences existed in the means of cost figures and the number of second- or fourth-grade students per session when the summer programs were grouped by type of program and level of effectiveness. The analysis was based on the following variables, types of programs (explained in Chapter 4), and levels of effectiveness.

Analysis Variables

total cost per student,
class instructor cost per student,
staff cost per student,
facility cost per student,
equipment cost per student,
materials cost per student,
total cost per pupil-hour, and
number of second- or fourth-grade students per session.

Table 28

GRADE 4: ANALYSIS OF VARIANCE OF COSTS ACROSS AND WITHIN EFFECTIVENESS CATEGORIES[a]

	Above-Average Schools	Average Schools	Below-Average Schools	F Ratio[b]	R^2
Total Cost per Student	64.21 (19.50)	55.79 (30.16)	34.40 (23.94)	.59	.08
Class Instructor Cost per Student	54.62 (17.83)	37.30 (19.72)	11.65 (6.36)	2.65	.27
Staff Cost per Student	54.62 (17.83)	49.31 (27.16)	31.02 (22.55)	.50	.07
Facility Cost per Student	6.70 (1.00)	5.50 (3.24)	1.77 (.85)	1.60	.19
Equipment Cost per Student	.81 (.30)	.27 (.29)	.34 (.16)	2.93	.31
Materials Cost per Student	2.02 (.46)	.68 (.48)	.64 (.19)	7.55[c]	.52
Total Cost per Pupil-Hour	.47 (.25)	.58 (.27)	.44 (.33)	.34	.05
Sample Size	2	13	2		

a. Standard deviations are displayed in parentheses below the means.

b. Degrees of freedom are 2 and 14. Differences are significant at the 0.05 level for values in excess of 3.74.

c. Significant differences at the 0.05 level in the average values across the effectiveness categories.

Table 29

GRADE 4: ANALYSIS OF VARIANCE OF PROGRAM/SCHOOL CHARACTERISTICS ACROSS AND WITHIN EFFECTIVENESS CATEGORIES[a]

	Above-Average Schools	Average Schools	Below-Average Schools	F Ratio[b]	R^2
Program Length in Instructional Hours	146.50 (37.48)	94.77 (29.94)	89.00 (1.41)	2.83	.29
Fourth-Grade Students	6.00 (2.83)	12.54 (9.46)	4.50 (2.12)	1.06	.13
Fourth-Grade Students per Session	1.50 (.71)	5.05 (2.86)	4.50 (2.12)	1.48	.17
Total Students in Fourth-Grade Classes	34.00 (8.48)	35.23 (29.22)	19.50 (3.54)	.29	.04
Total Students per Session	7.90 (2.97)	12.79 (7.53)	19.50 (3.54)	1.37	.16
Total School Enrollment	58.00 (25.46)	105.15 (61.02)	114.50 (40.30)	.64	.08
School Student-Staff Ratio	26.35 (19.30)	13.35 (4.80)	26.60 (23.19)	3.11	.31
Sample Size	2	13	2		

a. Standard deviations are displayed in parentheses below the means.

b. Degrees of freedom are 2 and 14. Differences are significant at the 0.05 level for values in excess of 3.74.

Types of Programs

remedial,
compensatory,
remedial and enrichment, and
enrichment.

Levels of Effectiveness

above average,
average, and
below average.

The existence of significant differences among the mean values could indicate a relationship between the level of effectiveness a program achieves, the type of educational services provided by the program (e.g., remedial versus enrichment), and the amount and type of resources used (e.g., class instructor versus equipment). However, no such relationships were found in this analysis.

Methodology for Analysis of Variance

A two-way analysis of variance is extremely difficult to conduct if there are unequal block sizes as was the case in this analysis. Because of the desire to examine the simultaneous impact of two variables, it was decided to use regression techniques and a series of dummy variables for each of the various levels for the two variables. The general regression equation was of the form:

$$\text{Cost} = \text{constant} + \Sigma\, a_i m_i + \Sigma\, b_j n_j + \varepsilon,$$

where the constant, a_i, and b_j are the regression coefficients. In addition, m_i is the set of dummy variables representing the various levels of the first variable, and n_j is the set of dummy variables representing the various levels of the second variable. The dummy variables representing the appropriate levels for a particular school are set to 1, while the remaining dummy variables are set to 0. This can best be demonstrated by an example. Assume the following representation for effectiveness and type of program:

Types of Programs

m_1 = remedial
m_2 = compensatory
m_3 = remedial and enrichment
m_4 = enrichment

Levels of Effectiveness

n_1 = above average
n_2 = average
n_3 = below average

Assume that a particular school was judged to be a remedial program with average effectiveness. The values of the dummy variables are thus:

$m_1 = 0$ $n_1 = 1$
$m_2 = 1$ $n_2 = 0$
$m_3 = 0$ $n_3 = 0$
$n_4 = 0$

The actual representation of this school in the regression observations would be:

Cost = constant + a_2 + b_1.

After all the observations have been defined, a regression analysis is performed to determine the regression coefficients. A separate multidimensional F test is then conducted to determine if the coefficients for each dummy set are jointly, rather than singly, different from zero. If they are, the conclusion is that there are significant differences in cost associated with the various levels of the basic variables.

Because a single regression equation is estimated, only one value of R^2 is calculated. This R^2 represents the combined ability of the two basic variables to estimate the cost of the program.

Results for Second Grade

Table 30 provides the F test results of the analysis for schools with programs for second-grade students. The F test was made at the 0.05 level of significance. The F ratio in the first column measures the significance of the stratification effects of levels of effectiveness independent of the effects of types of programs. The F ratio in the second column measures the significance of the stratification effects of types of programs independent of the effects of levels of effectiveness. To be significant at the 0.05 level of significance, the F ratios in the first column would have to exceed 5.14, and, in the second column, the F ratio would have to exceed 4.76.

Table 30

GRADE 2: ANALYSIS OF VARIANCE FOR STRATIFICATION BY LEVEL OF EFFECTIVENESS AND TYPE OF PROGRAM

	F Ratio[a] (level of effectiveness)	F Ratio[b] (type of program)	R^2	R^2 (corrected for degrees of freedom)
Total Cost per Student	1.52	2.34	.46	.22
Class Instructor Cost per Student	.33	4.74	.55	.36
Staff Cost per Student	1.56	2.01	.44	.19
Facility Cost per Student	.46	3.99	.53	.32
Equipment Cost per Student	2.45	.70	.34	.06
Materials Cost per Student	1.68	.86	.26	.06
Total Cost per Pupil-Hour	3.04	1.60	.47	.24
Second-Grade Students per Session	2.66	4.33	.61	.44

a. Degrees of freedom are 2 and 6. Differences are significant at the 0.05 level for values in excess of 5.14.

b. Degrees of freedom are 3 and 6. Differences are significant at the 0.05 level for values in excess of 4.76.

The F ratio in the second column (type of program) for class instructor cost per student is nearly significant. This reflects the findings in the analysis of variance in Chapter 4, where significant differences existed in several of the average cost figures among the types of programs. However, when the programs are further stratified by level of effectiveness, the differences in the cost figures become smaller.

Table 30 also presents the R^2 statistic (coefficient of determination). More of the variance in the cost figures and the number of students per session is explained when the programs are grouped both by level of effectiveness and type of program than when they are stratified only by level of effectiveness. However, as shown in the table, the values for R^2 are considerably smaller when corrected for degrees of freedom. This is because of the small sample size. The corrected R^2 is the more meaningful one to use.

Results for Fourth Grade

Table 31 presents the results of the same analysis of data from schools having programs for fourth-grade students. Again, the F test was made at the 0.05 level of significance. For an F ratio to be significant, its value must exceed 5.14 for level of effectiveness (column 1) and 4.76 for type of program (column 2).

As shown in Table 31, none of the differences among mean values can be considered significant. The F ratio in the first column for materials cost per student is the closest to being significant. This is consistent with the results of the preceding analysis of variance for fourth grade in which this same cost variable was the only one with significant results.

A Caution

Some caution should be used in interpreting these results. While nothing stood out that tied resources to program type to effectiveness level, the sample was so small and unevenly distributed that the results of the analysis should be considered tentative. The distribution of schools with second- and fourth-grade summer programs is presented in Table 32.

Table 31

GRADE 4: ANALYSIS OF VARIANCE FOR STRATIFICATION BY LEVEL OF EFFECTIVENESS AND TYPE OF PROGRAM

	F Ratio[a] (level of effectiveness)	F Ratio[b] (type of program)	R^2	R^2 (corrected for degrees of freedom)
Total Cost per Student	.02	1.74	.39	.01
Class Instructor Cost per Student	.43	2.67	.59	.33
Staff Cost per Student	.02	1.65	.37	.02
Facility Cost per Student	.03	1.95	.48	.15
Equipment Cost per Student	2.30	1.59	.52	.22
Materials Cost per Student	5.00	.19	.54	.25
Total Cost per Pupil-Hour	.51	1.74	.38	.02
Fourth-Grade Students per Session	1.10	1.06	.37	.03

a. Degrees of freedom are 2 and 6. Differences are significant at the 0.05 level for values in excess of 5.14.

b. Degrees of freedom are 3 and 6. Differences are significant at the 0.05 level for values in excess of 4.76.

Table 32

LEVEL OF EFFECTIVENESS

	Above Average		Average		Below Average		Total	
	Grade 2	Grade 4	Grade 2	Grade 4	Grade 2	Grade 4	Grade 2	Grade 4
Remedial	3	1	7	8	1	0	11	9
Compensatory	0	1	3	2	0	0	3	3
Remedial and Enrichment	0	0	4	2	1	2	5	4
Enrichment	0	0	2	1	1	0	3	1
Total	3	2	16	13	3	2	22	17

T-TEST COMPARISONS OF ABOVE- AND BELOW-AVERAGE SCHOOLS

The preceding analyses of variance looked for significant differences among all three effectiveness categories (above average, average, and below average). In a separate analysis, we wished to determine what costs and program/school characteristics might help to explain why some programs were above average and others were below average.

First, we selected the costs and program/school characteristics that showed sizable differences between the mean values of the above-average programs and the below-average programs. Then, we conducted two-sided t-test comparisons to determine if these differences were significant at the 0.05 level of significance.

Results for Second Grade

The costs and program/school characteristics for schools with summer programs for second-grade students are shown in Table 33 along with the t-test results. The t-values are presented as well as the ranges that the resulting t-values must exceed to be significant. The results indicate that none of the differences between mean values for above-average and below-average schools with second-grade programs are significant at the 0.05 level of significance. As a result, there is no evidence that these variables can help distinguish between above-average and below-average schools with summer programs for second-grade students.

Results for Fourth Grade

A visual inspection of the average values for schools having summer programs for fourth-grade students revealed a somewhat different set of variables that had considerable differences between schools categorized as either above average or below average. Table 34 lists these costs and program/school characteristics, their mean values, t-values, and the ranges to be exceeded to be significant at a 0.05 level of significance in a two-sided test.

Two costs and one program/school characteristic show significant differences between the mean values for above-average schools and the mean values for below-average schools. These variables are:

Table 33

GRADE 2: T-TEST COMPARISONS OF ABOVE- AND BELOW-AVERAGE SCHOOLS[a]

	Mean Values		
	Above-Average Schools	Below-Average Schools	t-value
Costs			
Total Cost per Student	91.95	51.82	1.49
Class Instructor Cost per Student	48.63	20.18	1.39
Staff Cost per Student	81.25	47.41	1.39
Facility Cost per Student	7.87	3.25	1.67
Equipment Cost per Student	2.12	.26	1.22
Total Cost per Pupil-Hour	1.04	.70	1.15
Program/School Characteristics			
Second-Grade Students per Session	9.67	11.33	-.23
Total Students per Session	12.33	20.00	-1.25
School Student-Staff Ratio	9.47	19.13	-.80

a. No significant differences were found at the 0.05 level (two-sided) between the mean values of above-average and below-average schools.

Table 34

GRADE 4: T-TEST COMPARISONS OF ABOVE- AND BELOW-AVERAGE SCHOOLS

	Mean Values		
	Above-Average Schools	Below-Average Schools	t-value
Costs			
Total Cost per Student	64.21	34.40	1.37
Class Instructor Cost per Student	54.62	11.65	3.21
Staff Cost per Student	54.62	31.02	1.16
Facility Cost per Student	6.70	1.77	5.33[a]
Equipment Cost per Student	.81	.34	1.94
Materials Cost per Student	2.02	.64	3.95[a]
Program/School Characteristics			
Program Length in Instructional Hours	146.50	89.00	2.17
Fourth-Grade Students per Session	1.50	4.50	-1.90
Total Students per Session	7.90	19.50	-3.55[a]
Total School Enrollment	58.00	114.50	-1.68

a. Significant differences at the 0.05 level (two-sided) between the mean values of above-average and below-average schools.

- facility cost per student,
- materials cost per student, and
- total students per session.

The fact that facility and materials costs per student differ significantly between above-average and below-average schools is not very useful, since the relationship between these resources and educational achievement cannot be considered very strong. Possibly more closely related to educational outcome is the total number of students per session. The significant differences between above-average and below-average schools in this variable may have some meaningful use in predicting educational outcome or in establishing program guidelines.

Although the values for these variables can distinguish above-average schools from below-average schools, additional t-tests showed that they do not distinguish between above-average and average schools. The exception to this statement is materials cost per student, where the mean cost for average schools is very close to the mean materials cost for below-average schools. Therefore, this variable demonstrates a significant difference between above-average and average schools.

In conclusion, the t-tests show some statistically significant results at the two ends of the effectiveness spectrum (i.e., above average and below average). However, the results by themselves have limited practical value.

CONCLUSION

The preceding statistical analyses do not offer very meaningful results in terms of explaining why a summer reading program for second- or fourth-grade students is above average, average, or below average in effectiveness. Thus, no predictive capability and only limited policy guidance resulted from the analyses.

However, these results should not be considered conclusive since the sample size was small and unevenly distributed among the effectiveness categories. The numbers of schools classified as above and below average were especially small (three in each category for second-grade programs and two in each category for fourth-grade programs) for analysis purposes. As a result, we had to stretch what could be accomplished statistically with the sample. We were looking for gross indicators of relationships and found none of major consequence.

APPENDIX A

DATA COLLECTION GUIDE

SUMMER PROGRAM
COST DATA COLLECTION GUIDE

School__________________________

City/State_______________________

No. ____________________________

INTERVIEWER:____

INDIVIDUAL INTERVIEWED:__________________________________

TITLE:____

TELEPHONE:____

GUIDE TO INTERVIEWER

There are two purposes to our site visits. First, we are interested in determining a general description of the summer program being given at this school. This description will include the entire program, but will have special emphasis on the reading program. Second, we are interested in collecting information as to the types, quantities, and use of various kinds of resources.

Section A of this questionnaire is designed to assist you in describing the program. Following the site visit, it will be your task to write a 3-5 page summary describing the program. This summary is required by the contract. The questionnaire is designed in such a way to serve as a way of structuring that summary.

Section B is designed to collect information about specific types of resources. You will be supplied with the resource questionnaire that this school completed earlier in the year. Much of Section B is directed at determining how these resources are being utilized. If it should occur that the summer program is not being held in the actual school building that was involved in the full-year study, additional questions must be answered concerning the books and equipment available in this school. This is the purpose of Section C.

There is no particular order in which the questionnaire must be completed. The organization of this questionnaire is not necessarily for the convenience of the interviewer. Particularly when discussing the program in general, it may be more convenient to skip around. Thus, try to understand the questionnaire before the site visit begins.

The next page is a quick summary chart of the general elements of the program.

SUMMARY INFORMATION

---

1. **Staff**

Type	Number	Average Hours Worked Per Day
Reading Teachers	___	__________
Other Teachers	___	__________
Administrators	___	__________
Reading Aides	___	__________
Specialists (specify)		
____________	___	__________
____________	___	__________
____________	___	__________
____________	___	__________
____________	___	__________

---

2. Program Components (check all subjects taught)

Reading, Language Arts	___
Mathematics	___
Science	___
Social Studies	___
Other (specify)	
____________	___
____________	___
____________	___

---

3. Program Participants

Type	Number
Students	___
Parents	___
Other Community Residents	___
Others (specify)	
___________	___
___________	___
___________	___

---

4. Program Focus (Check the best description)

Remedial ___
Compensatory ___
Enrichment ___
Supplemental ___
Other (specify)
___________ ___

SECTION A

General School Description

Discuss the entire program with special emphasis on the reading program.

A1. How long is the program?

A2. What are the hours of the program? What times during the day do classes meet?

A3. What are the primary goals of the summer program? What are the expectations for this project?

A4. How do these goals differ from the goals for the regular school year? Obtain a clear statement of the goals for the regular school year, and probe for differences. Try to explain differences.

A5. What are some of the special needs of the children who attend? Why are they participating?

A6. How were students selected to participate in the summer program? Is this selection process different from the one that occurs in determining the students in compensatory reading during the regular school year? Was it based on tests or opinions?

A7. What tests or formal diagnostic assessments did participants receive while in the program? Probe for names of tests and time given, or the titles of staff and procedures used in making the diagnostic assessment.

A8. **Describe a "typical day" for a student. Probe for staff roles and tasks, expectations about students and their performance, materials used, and content matter taught.**

A9. What are some of the major milestones in the summer program? When did it begin? End? Sequence of events: testing of students, staff training.

A10. Did the staff receive training especially to work in the summer program?

Yes ____
No ____

A10a. If "Yes", describe training. When was it done, the scope and purpose.

A10b. If "No", did the staff receive any training in the past two years that relates to the summer program?

A11. Describe the organization of the project. Who is responsible for administration, coordination, planning, teaching, testing, etc. Probe for task, and title, not names.

A12. Describe the role of the community and/or parents with respect to the summer program. How were the parents informed? Were they involved in planning, encouraging, serving as aides? How do they feel about the program?

A13. What are some of the problems encountered so far? How were they solved?

A14. What are some of the successes of the summer program? Probe for both educational and non-educational successes.

A15. How close did the program come to achieving its goals? Probe for what caused the project not to achieve its goals.

A16. What changes could be made in the program to improve it?

SECTION B

This section collects specific information about the reading program. Refer to Resource Questionnaire.

B1.

Grade	No. of Teachers	No. of Aides	No. of Students
1			
2			
3			
4			
5			
6			

B2. Do the teachers listed above teach only reading? If they don't, what percentage of time do they teach reading?

B3. Do they consider it a compensatory reading program?

B4. How many hours per week is reading taught?

B5. What other professionals assist these teachers, and how much are they available? Psychologists, speech or hearing specialist, diagnostician, etc?

B6. What are the primary and secondary duties of the teacher aides?

Primary Duties ____________
Secondary Duties ____________

a. Instruction or reinforcement	c. Evaluating problems
b. Receiving training	d. General assistance

B7. How are professionals paid?

Title	Method	Amount
Teachers	___	
Diagnosticians	___	

a. Paid on an hourly basis at a rate comparable to their 10 month salary.

b. Paid as above with a bonus. (Indicate amount of bonus.)

c. Fixed amount (Indicate amount).

d. Other basis. (Indicate.)

B8. If there were student-related centers available to the school during the normal term, are they also open during the summer program? If they are, are the services the same? Is the staff the same?

a. Center 1

b. Center 2

c. Center 3

B9. If there were resource-related centers available to the school during the normal term, are they also open during the summer term? If they are open, are the services the same? Is the staff the same?

a. Center 1

b. Center 2

c. Center 3

B10. Who from the district assists with the summer program? What are their other duties? How many schools do they work with? What percentage of their time is spent assisting the summer program?

B11.	Is the transportation provided to students in the summer program?	Yes .... ☐ No .... ☐
	(IF YES) How many students receive this service? (ENTER THE DAILY AVERAGE OF STUDENT ROUND-TRIPS BY GRADE. IF NONE, WRITE "NONE.")	

Grade	Student Round-Trips
2	
4	
6	

On the average, how far are these students transported for each round trip? (CHECK ONLY ONE.)	1 - 3 miles .... ☐ 4 - 6 miles .... ☐ 7 - 9 miles .... ☐ 10 or more miles .... ☐
How is this transportation provided? (CHOOSE THE ONE METHOD TRANSPORTING THE MOST STUDENTS.)	School-owned bus .... ☐ Other school-owned vehicle ...... ☐ Contracted transportation service . ☐ Personal vehicles .... ☐ Other (SPECIFY) ____________________ .... ☐

The balance of the questions in Section B discuss the previously collected inventory of books and equipment found in the school. If the actual classes are being held in a different school, complete Section C first, and then come back and finish this section.

B12. How is the equipment in the school used compared to the regular session? Is equipment used about as often, or is equipment used more ofter? Why? Discuss each type of equipment separately if there are significant differences.

B13. Discuss the use of books during the summer program. Are relatively more books used than during the regular program?

B14. Are any programmed readers used? (Alpha I, DISTAR, etc) How many students use them? Is it different from regular program?

B15. Is the school library open during the summer program for regular use?

SECTION C

This section is to be completed only if the actual school which houses the summer program is different from the one which completed the pink Resource Questionnaire.

C1. How many classrooms do you have in your school? Include any room designed or adapted for regularly scheduled group instruction. Do not include mobile or temporary classrooms. ________

C2. How many mobile or temporary classrooms do you have? (IF NONE, WRITE "NONE.") ________

C3. What is the total floor space of your school in square feet? Use the outside dimension of your school times the number of floors. For example, a two-story school that is 150 feet long and 50 feet wide would have a total floor space of 150 x 50 x 2 = 15,000 square feet. ________

C4. In what year was your school originally built? ____________

C5. In what year was the last major modification made to your school? Examples of a major modification would be the construction of additional classrooms, or the modernization of the school building (IF NO MODIFICATIONS HAVE BEEN MADE, WRITE "NONE".) ____________

C6. For each type of equipment listed, indicate the number available in your school. Please include all equipment items regardless of their use. (IF NONE, WRITE "NONE.")

C6a. How often is each type of equipment used in reading instruction, either compensatory or developmental, as opposed to use for other subject areas in your school? (CHECK THE MOST APPROPRIATE DESCRIPTION OF ITS USE.)

	Q. 23.	Q. 23a.				
	Number that are available	Almost Always Used in Reading	Generally Used in Reading	Used About Half the Time in Subject Areas Other Than Reading	Generally Used in Subject Areas Other Than Reading	Almost Always Used in Subject Areas Other Than Reading
Tape Recorder	____	☐	☐	☐	☐	☐
Record Player	____	☐	☐	☐	☐	☐
Movie Projector	____	☐	☐	☐	☐	☐
Filmstrip Projector	____	☐	☐	☐	☐	☐
Slide Projector	____	☐	☐	☐	☐	☐
Opaque Projector	____	☐	☐	☐	☐	☐
Overhead Projector	____	☐	☐	☐	☐	☐
Television	____	☐	☐	☐	☐	☐
Language Master	____	☐	☐	☐	☐	☐
Tachistoscope	____	☐	☐	☐	☐	☐
Controlled Reader	____	☐	☐	☐	☐	☐
Shadowscope Reading Pacer	____	☐	☐	☐	☐	☐
Other Major Equipment (SPECIFY):						
____________	____	☐	☐	☐	☐	☐
____________	____	☐	☐	☐	☐	☐
____________	____	☐	☐	☐	☐	☐
	3CC			1CC		

C7. What is the approximate inventory of basal readers used in your school for reading instruction, either developmental or compensatory? How many are used exclusively for compensatory reading? (CHECK ONE IN EACH COLUMN.)

	Total Basal Readers Used for All Reading	Basal Readers Used Exclusively for Compensatory Reading
None	☐ -01	☐ -01
1 - 9	☐ -02	☐ -02
10 - 24	☐ -03	☐ -03
25 - 49	☐ -04	☐ -04
50 - 99	☐ -05	☐ -05
100 - 199	☐ -06	☐ -06
200 - 399	☐ -07	☐ -07
400 - 799	☐ -08	☐ -08
800 - 1,599	☐ -09	☐ -09
1,600 - 3,199	☐ -10	☐ -10
3,200 or over	☐ -11	☐ -11
	9-10	11-12

C8. Approximately how many books are in your school library?

No Library .... ☐
1 - 499 .... ☐
500 - 999 .... ☐
1,000 - 1,999 .... ☐
2,000 - 3,999 .... ☐
4,000 - 5,999 .... ☐
6,000 - 7,999 .... ☐
8,000 - 9,999 .... ☐
10,000 or over .... ☐

C9. Does your school have any commercially available reading sets (e.g., Alpha One, Sullivan, Distar, etc.)?

Yes .... ☐
No (END OF QUESTIONNAIRE). ☐

C9a. (IF YES) Please indicate the name, publisher, and number of students for which the set was purchased.

	Set Name	Publisher	Number of Students
1.			
2.			
3.			
4.			
5.			

APPENDIX B

COST RESULTS BY SCHOOL

APPENDIX B

COST RESULTS BY SCHOOL

This appendix presents the outputs of the summer reading program cost model for each school. A detailed explanation of the cost model methodology can be found in Chapter 2 of this volume.

The cost outputs are organized by school. Each table represents a school whose ID number is in the upper lefthand corner of the table. The left side of the table lists the class descriptors and the resource categories. The shorter columns to the far right of the table are the weighted grade cost columns. These columns do not have any associated class descriptors. These columns are weighted averages of the class cost columns, where the weights are the number of students in the grade whose weighted cost is being calculated.

A class may represent more than one group of students when the number of sessions is greater than one. When this occurs, the effective class size, or the number of students a teacher instructs at any given time, is equal to the number of students divided by the number of sessions. Hence, one can see that the number of students is the total from all sessions the teacher instructs.

Each of the major resource categories has a subtotal line, which is the sum of the resource item costs in that category. The total cost is displayed at the bottom of the page, which is the sum of all costs in a particular class or grade.

These figures were used for the cost analysis of the summer compensatory reading programs. However, two files are inherent in the data. The first file includes the class cost columns. There are 59 classes in this study. The second file includes the weighted grade cost columns. There are 25 second-grade weighted costs, 20 fourth-grade weighted costs, and 12 sixth-grade weighted costs, totaling 57 weighted grade cost columns.

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS
AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 5

Class	21	41		
Number of Sessions	1	1		
Number of Students	11	8		
Number in Grade 2	5	0		
Number in Grade 4	0	8		
			Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade
Resource				
Class Instructor	38.57	53.03	38.57	53.03
Teacher Aide	8.96	12.32	8.96	12.32
Staff Subtotal	47.53	65.35	47.53	65.35
Facility Subtotal	7.32	10.07	7.32	10.07
Tape Recorders/Record Players	.18	.24	.18	.24
Teaching Machines	.19	.26	.19	.26
Movie/Filmstrip Projectors	.01	.02	.01	.02
Slide/Overhead/Opaque Project.	.01	.01	.01	.01
Equipment Subtotal	.39	.53	.39	.53
Basal Readers	1.02	1.40	1.02	1.40
Other Supplies and Materials	.10	.10	.10	.10
Materials Subtotal	1.12	1.50	1.12	1.50
Total Cost	56.36	77.45	56.36	74.35

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 12

Class	21	41	61			
Number of Sessions	2	2	2			
Number of Students	18	13	13			
Number in Grade 2	8	0	0			
Number in Grade 4	0	6	0			
Number in Grade 6	0	0	8			
				Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade	Weighted Average Cost for the Sixth Grade
Resource						
Class Instructor	20.98	25.98	19.15	20.98	25.98	19.15
Staff Subtotal	20.98	25.98	19.15	20.98	25.98	19.15
Facility Subtotal	2.31	3.20	3.20	2.31	3.20	3.20
Tape Recorders/Record Players	.17	.02	.02	.17	.02	.02
Movie/Filmstrip Projectors	.04	.01	.03	.04	.01	.03
Television/Video Tape Players	0	.01	.01	.0	.01	.01
Equipment Subtotal	.21	.04	.06	.21	.04	.06
Basal Readers	0	0	0	0	0	0
Individual Reading Kits	.12	0	.16	.12	0	.16
Library Books	.47	.47	.47	.47	.47	.47
Other Supplies and Materials	.03	.03	.03	.03	.03	.03
Materials Subtotal	.61	.50	.66	.61	.50	.66
Resource Related Center	.33	.33	.33	.33	.33	.33
District Centers Subtotal	.33	.33	.33	.33	.33	.33
Total Cost	24.44	30.04	23.39	24.44	30.04	23.39

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS
AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 20

Class	21	41	61			
Number of Sessions	1	1	1			
Number of Students	12	12	12			
Number in Grade 2	5	0	0			
Number in Grade 4	0	7	0			
Number in Grade 6	0	0	8			
				Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade	Weighted Average Cost for the Sixth Grade
Resource						
Class Instructor	27.40	27.40	39.39	27.40	27.40	39.39
Reading Specialist	3.36	3.36	3.36	3.36	3.36	3.36
Supervision and Coor. Staff	20.38	20.38	20.38	20.38	20.38	20.38
Staff Subtotal	51.14	51.14	63.13	51.14	51.14	63.13
Facility Subtotal	4.86	4.86	4.86	4.86	4.86	4.86
Tape Recorders/Record Players	.16	.08	.16	.16	.08	.16
Movie/Filmstrip Projectors	.03	.03	.03	.03	.03	.03
Slide/Overhead/Opaque Project.	.11	.02	.11	.11	.02	.11
Television/Video Tape Players	.02	.02	.02	.02	.02	.02
Equipment Subtotal	.32	.15	.32	.32	.15	.32
Basal Readers	.04	.04	0	.04	.04	0
Individual Reading Kits	.04	.04	.08	.04	.04	.08
Other Supplies and Materials	.04	.04	.04	.04	.04	.04
Materials Subtotal	.12	.12	.12	.12	.12	.12
Total Cost	56.44	56.27	68.43	56.44	56.27	68.43

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS
AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES
School: 28

Class	21	
Number of Sessions	3	
Number of Students	26	
Number in Grade 2	9	
		Weighted Average Cost for the Second Grade
Resource		
Class Instructor	19.65	19.65
Supervision and Coord. Staff	1.71	1.71
Staff Subtotal	21.36	21.36
Facility Subtotal	3.20	3.20
Tape Recorders/Record Players	.12	.12
Equipment Subtotal	.12	.12
Basal Readers	.02	.02
Other Supplies and Materials	.05	.05
Materials Subtotal	.07	.07
Total Cost	24.75	24.75

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 30

Class	21	41	61			
Number of Sessions	2	2	2			
Number of Students	15	23	23			
Number in Grade 2	15	0	0			
Number in Grade 4	0	9	0			
Number in Grade 6	0	0	15			
				Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade	Weighted Average Cost for the Sixth Grade
Resource						
Class Instructor	48.66	28.38	28.38	48.66	28.38	28.38
Staff Subtotal	48.66	28.38	28.38	48.66	28.38	28.38
Facility Subtotal	5.37	3.50	3.50	5.37	3.50	3.50
Tape Recorders/Record Players	.54	.17	.17	.54	.17	.17
Teaching Machines	1.91	.12	.12	1.91	.12	.12
Movie/Filmstrip Projectors	.01	.04	.04	.01	.04	.04
Slide/Overhead/Opaque Project.	.03	.10	.10	.03	.10	.10
Equipment Subtotal	2.49	.43	.43	2.49	.43	.43
Individual Reading Kits	0	0	.02	0	0	.02
Library Books	.58	.58	.58	.58	.58	.58
Other Supplies and Materials	.09	.09	.09	.09	.09	.09
Materials Subtotal	.67	.67	.69	.67	.67	.69
Total Cost	57.19	32.99	33.00	57.19	32.99	33.00

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 41

Class	21	22	42		
Number of Sessions	3	3	3		
Number of Students	11	11	11		
Number in Grade 2	3	4	0		
Number in Grade 4	0	2	3		
				Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade
Resource					
Class Instructor	69.67	69.67	59.84	69.67	63.77
Teacher Aide	3.45	0	6.95	1.49	4.17
Supervision and Coord. Staff	16.05	16.05	16.05	16.05	16.05
Staff Subtotal	89.20	85.72	82.85	87.21	84.00
Facility Subtotal	11.36	11.36	11.36	11.36	11.36
Tape Recorders/Record Players	.14	.28	.03	.22	.13
Teaching Machines	.44	.44	.88	.44	.70
Movie/Filmstrip Projectors	.14	.07	.14	.10	.11
Slide/Overhead/Opaque Project.	.02	.02	.02	.02	.02
Television/Video Tape Players	.02	.02	.02	.02	.02
Equipment Subtotal	.76	.83	1.09	.80	.99
Basal Readers	.13	.13	.03	.13	.07
Library Books	1.14	1.14	1.14	1.14	1.14
Other Supplies and Materials	.08	.08	.08	.08	.08
Materials Subtotal	1.35	1.36	1.25	1.35	1.29
Total Cost	102.67	99.27	96.55	100.72	97.64

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 46

Class	61	
Number of Sessions	2	
Number of Students	50	
Number in Grade 6	32	
		Weighted Average Cost for the Sixth Grade
Resource		
Class Instructor	7.83	7.83
Non-Teaching Non-Academ. Staff	.76	.76
Supervision and Coord. Staff	1.73	1.73
Staff Subtotal	10.32	10.32
Facility Subtotal	1.39	1.39
Tape Recorders/Record Players	.02	.02
Equipment Subtotal	.02	.02
Individual Reading Kits	.01	.01
Library Books	.72	.72
Other Supplies and Materials	.07	.07
Materials Subtotal	.80	.80
Total Cost	12.53	12.53

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 47

Class	22	41		
Number of Sessions	1	4		
Number of Students	33	102		
Number in Grade 2	14	0		
Number in Grade 4	0	32		
Number in Grade 6	0	0		
			Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade
Resource				
Class Instructor	8.19	11.04	8.19	11.04
Non-Teaching Non-Academ. Staff	.57	.57	.57	.57
Supervision and Coord. Staff	1.31	1.31	1.31	1.31
Staff Subtotal	10.07	12.92	10.07	12.92
Facility Subtotal	1.05	1.36	1.05	1.36
Tape Recorders/Record Players	.01	.02	.01	.02
Movie/Filmstrip Projectors	.03	.02	.03	.02
Slide/Overhead/Opaque Project.	.01	.02	.01	.02
Equipment Subtotal	.05	.06	.05	.06
Basal Readers	.06	.01	.06	.01
Individual Reading Kits	.02	.00	.02	.00
Library Books	.72	.72	.72	.72
Other Supplies and Materials	.07	.07	.07	.07
Materials Subtotal	.86	.80	.86	.80
Total Cost	12.03	15.13	12.03	15.13

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 71

Class	21	41		
Number of Sessions	1	1		
Number of Students	18	21		
Number in Grade 2	14	0		
Number in Grade 4	0	13		
			Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade
Resource				
Class Instructor	16.88	14.47	16.88	14.47
Reading Specialist	.72	.72	.72	.72
Supervision and Coord. Staff	15.73	15.73	15.73	15.73
Staff Subtotal	33.33	30.92	33.33	30.92
Facility Subtotal	2.08	1.79	2.08	1.79
Tape Recorders/Record Players	.16	.14	.16	.14
Teaching Machines	.05	.04	.05	.04
Movie/Filmstrip Projectors	.08	.06	.08	.06
Slide/Overhead/Opaque Project.	.01	.01	.01	.01
Equipment Subtotal	.30	.25	.30	.25
Basal Readers	.07	.06	.07	.06
Individual Reading Kits	.06	.05	.06	.05
Other Supplies and Materials	.10	.10	.10	.10
Materials Subtotal	.24	.21	.24	.21
Resource Related Center	.57	.57	.57	.57
District Centers Subtotal	.57	.57	.57	.57
Total Cost	36.52	33.74	36.52	33.74

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 104

Class	21	41		
Number of Sessions	1	1		
Number of Students	15	18		
Number in Grade 2	7	0		
Number in Grade 4	0	10		
			Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade
Resource				
Class Instructor	37.99	41.02	37.99	41.02
Teacher Aide	0	3.12	0	3.12
Non-Teaching Academic Staff	3.01	3.01	3.01	3.01
Non-Teaching Non-Academ. Staff	2.80	2.80	2.80	2.80
Supervision and Coord. Staff	8.76	8.76	8.76	8.76
Staff Subtotal	52.56	58.71	52.56	58.71
Facility Subtotal	5.43	4.52	5.43	4.52
Tape Recorders/Record Players	.32	.27	.32	.27
Movie/Filmstrip Projectors	.23	.19	.23	.19
Equipment Subtotal	.55	.46	.55	.46
Basal Readers	.03	.00	.03	0
Individual Reading Kits	.01	.01	.01	.01
Library Books	.91	.91	.91	.91
Other Supplies and Materials	.06	.06	.06	.06
Materials Subtotal	1.01	.98	1.01	.98
Total Cost	59.55	64.67	59.55	64.67

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES
School: 119

Class	21	
Number of Sessions	1	
Number of Students	20	
Number in Grade 2	20	
		Weighted Average Cost for the Second Grade
Resource		
Class Instructor	31.82	31.82
Teacher Aide	11.09	11.09
Non-Teaching Non-Academ. Staff	4.38	4.38
Supervision and Coord. Staff	50.97	50.97
Staff Subtotal	98.26	98.26
Facility Subtotal	6.04	6.04
Tape Recorders/Record Players	.98	.98
Teaching Machines	1.72	1.72
Movie/Filmstrip Projectors	2.27	2.27
Slide/Overhead/Opaque Project.	.04	.04
Equipment Subtotal	5.01	5.01
Library Books	.51	.51
Other Supplies and Materials	.04	.04
Materials Subtotal	.55	.55
Resource Related Center	.01	.01
District Centers Subtotal	.01	.01
Total Cost	109.87	109.87

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS
AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 168

Class	21	41			
Number of Sessions	1	1			
Number of Students	12	12			
Number in Grade 2	4	0			
Number in Grade 4	0	4			
Number in Grade 6	0	4			
			Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade	Weighted Average Cost for the Sixth Grade
Resource					
Class Instructor	25.44	31.57	25.44	31.57	31.57
Teacher Aide	6.68	.67	6.68	.67	.67
Supervision and Coord. Staff	1.14	1.14	1.14	1.14	1.14
Staff Subtotal	33.26	33.38	33.26	33.38	33.38
Facility Subtotal	4.51	4.51	4.51	4.51	4.51
Equipment Subtotal	0	0	0	0	0
Other Supplies and Materials	.03	.03	.03	.03	.03
Materials Subtotal	.03	.03	.03	.03	.03
Total Cost	39.26	39.05	39.26	39.05	39.05

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS
AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 232

Class	21	41			
Number of Sessions	1	1			
Number of Students	27	22			
Number in Grade 2	8	0			
Number in Grade 4	0	6			
Number in Grade 6	0	2			
			Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade	Weighted Average Cost for the Sixth Grade
Resource					
Class Instructor	15.63	16.15	15.63	16.15	16.15
Supervision and Coord. Staff	30.81	30.81	30.81	30.81	30.81
Staff Subtotal	46.44	46.96	46.44	46.96	46.96
Facility Subtotal	1.93	2.37	1.93	2.37	2.37
Tape Recorders/Record Players	.02	.11	.02	.11	.11
Movie/Filmstrip Projectors	.07	.09	.07	.09	.09
Slide/Overhead/Opaque Project.	0	.03	0	.03	.03
Equipment Subtotal	.09	.23	.09	.23	.23
Basal Readers	.06	.08	.06	.08	.08
Individual Reading Kits	.04	.03	.04	.03	.03
Library Books	.31	.31	.31	.31	.31
Other Supplies and Materials	.09	.09	.09	.09	.09
Materials Subtotal	.51	.50	.51	.50	.50
Resource Related Center	1.27	1.27	1.27	1.27	1.27
District Centers Subtotal	1.27	1.27	1.27	1.27	1.27
Total Cost	50.24	51.33	50.24	51.33	51.33

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 249

Class	21
Number of Sessions	4
Number of Students	40
Number in Grade 2	11
Number in Grade 4	8
Number in Grade 6	3

		Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade	Weighted Average Cost for the Sixth Grade
Resource				
Class Instructor	42.01	42.01	42.01	42.01
Staff Subtotal	42.01	42.01	42.01	42.01
Facility Subtotal	6.00	6.00	6.00	6.00
Tape Recorders/Record Players	.16	.16	.16	.16
Teaching Machines	.29	.29	.29	.29
Movie/Filmstrip Projectors	.09	.09	.09	.09
Slide/Overhead/Opaque Project.	.06	.06	.06	.06
Equipment Subtotal	.60	.60	.60	.60
Library Books	1.56	1.56	1.56	1.56
Other Supplies and Materials	.14	.14	.14	.14
Materials Subtotal	1.70	1.70	1.70	1.70
Resource Related Center	.11	.11	.11	.11
District Centers Subtotal	.11	.11	.11	.11
Total Cost	50.42	50.42	50.42	50.42

School: 254

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS
AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

Class	21	41			
Number of Sessions	4	4			
Number of Students	85	83			
Number in Grade 2	25	0			
Number in Grade 4	0	12			
Number in Grade 6	0	21			
			Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade	Weighted Average Cost for the Sixth Grade
Resource					
Class Instructor	8.66	9.64	8.66	9.64	9.64
Supervision and Coord. Staff	1.02	1.02	1.02	1.02	1.02
Staff Subtotal	9.68	10.66	9.68	10.66	10.66
Facility Subtotal	1.54	1.57	1.57	1.54	1.57
Tape Recorders/Record Players	.07	.07	.07	.07	.07
Slide/Overhead/Opaque Project.	0	.01	0	.01	.01
Equipment Subtotal	.07	.02	0.07	.02	.02
Basal Readers	0	.06	0	.06	.06
Library Books	.63	.63	.63	.63	.63
Other Supplies and Materials	.09	.09	.09	.09	.09
Materials Subtotal	.72	.78	.72	.78	.78
Total Cost	12.01	13.03	12.01	13.03	13.03

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 294

Class	21	22	23	41	42	43		
Number of Sessions	4	4	4	4	4	4		
Number of Students	17	17	17	17	17	17		
Number in Grade 2	13	7	6	0	0	0		
Number in Grade 4	0	0	0	7	13	13		
Number in Grade 6	0	0	0	0	0	0		
							Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade
Resource								
Class Instructor	55.26	60.10	51.63	51.63	79.46	60.10	55.73	65.93
Supervision and Coord. Staff	11.45	11.45	11.45	11.45	11.45	11.45	11.45	11.45
Staff Subtotal	66.71	71.55	63.08	63.08	90.90	71.55	67.17	77.38
Facility Subtotal	9.80	9.80	9.80	9.80	9.80	9.80	9.80	9.80
Tape Recorders/Record Players	.35	.18	.35	.35	.35	.35	.30	.35
Movie/Filmstrip Projectors	.14	.03	.29	.14	.14	.03	.14	.10
Slide/Overhead/Opaque Project.	0	0	0	0	.02	0	0	.01
Television/Video Tape Players	.03	0	0	0	0	0	.02	0
Equipment Subtotal	.52	.21	.64	.49	.51	.38	.46	.45
Basal Readers	.07	0	.01	.01	0	0	.04	0
Library Books	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Other Supplies and Materials	.11	.11	.11	.11	.11	.11	.11	.11
Materials Subtotal	1.20	1.13	1.14	1.14	1.13	1.13	1.17	1.13
Total Cost	78.23	82.69	74.66	74.51	102.34	82.86	78.60	88.76

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS
AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 306

Class	21	22	23	24		
Number of Sessions	3	2	3	2		
Number of Students	23	16	21	16		
Number in Grade 2	8	5	6	3		
Number in Grade 4	8	0	0	5		
					Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade
Resource						
Class Instructor	35.54	46.97	38.92	58.28	42.16	44.29
Reading Specialist	17.81	17.81	17.81	17.81	17.81	17.81
Supervision and Coord. Staff	28.07	28.07	28.07	28.07	28.07	28.07
Staff Subtotal	81.42	92.85	84.80	104.16	88.04	90.17
Facility Subtotal	5.80	8.33	6.35	8.33	6.87	6.77
Tape Recorders/Record Players	.04	.29	.22	.59	.22	.25
Teaching Machines	.62	.90	.68	.90	.74	.73
Movie/Filmstrip Projectors	.01	.08	.06	.15	.06	.06
Slide/Overhead/Opaque Project.	.02	.03	.03	.03	.03	.02
Television/Video Tape Players	0	.02	.01	0	.01	0
Equipment Subtotal	.69	1.32	1.00	1.67	1.05	1.07
Basal Readers	.11	.02	.06	0	.06	.07
Library Books	.65	.65	.65	.65	.65	.65
Other Supplies and Materials	.09	.09	.09	.09	.09	.09
Materials Subtotal	.84	.76	.79	.73	.80	.80
Total Cost	88.75	103.26	92.94	114.89	96.76	98.81

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS
AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 317

Class	21	41		
Number of Sessions	1	1		
Number of Students	19	17		
Number in Grade 2	19	4		
Number in Grade 4	0	3		
			Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade
Resource				
Class Instructor	5.88	7.15	6.10	7.15
Teacher Aide	10.02	0	8.28	0
Non-Teaching Academic Staff	.16	.16	.16	.16
Non-Teaching Non-Academ. Staff	1.47	1.47	1.47	1.47
Supervision and Coord. Staff	6.29	6.29	6.29	6.29
Staff Subtotal	23.82	15.07	22.[illegible]	15.07
Facility Subtotal	1.04	1.17	1.06	1.17
Tape Recorders/Record Players	.37	.21	.34	.21
Teaching Machines	.05	.05	.05	.05
Movie/Filmstrip Projectors	.03	.16	.05	.06
Slide/Overhead/Opaque Project.	0	.02	0	.02
Television/Video Tape Players	.02	.02	.02	.02
Equipment Subtotal	.47	.46	.47	.46
Library Books	.70	.70	.70	.70
Other Supplies and Materials	.07	.07	.07	.07
Materials Subtotal	.78	.77	.77	.77
Total Cost	26.11	17.47	24.60	17.47

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS
AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES
School: 359

Class	21	22	
Number of Sessions	1	2	
Number of Students	5	10	
Number in Grade 2	5	10	
			Weighted Average Cost for the Second Grade
Resource			
Class Instructor	105.81	80.04	88.63
Supervision and Coord. Staff	23.61	23.61	23.61
Staff Subtotal	129.42	103.65	112.24
Facility Subtotal	13.05	13.05	13.05
Tape Recorders/Record Players	.12	.60	.44
Movie/Filmstrip Projectors	1.34	.67	.89
Slide/Overhead/Opaque Project.	.02	.01	.01
Television/Video Tape Players	.04	0	.01
Equipment Subtotal	1.52	1.28	1.36
Basal Readers	.01	0	0
Other Supplies and Materials	.07	.07	.07
Materials Subtotal	.08	.07	.07
Total Cost	144.07	118.06	126.72

School: 369

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS
AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

Class	21	22	41	61			
Number of Sessions	1	2	1	4			
Number of Students	6	10	6	22			
Number in Grade 2	4	2	2	0			
Number in Grade 4	1	0	0	3			
Number in Grade 6	1	0	0	3			
					Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade	Weighted Average Cost for the Sixth Grade
Resource							
Class Instructor	62.93	56.85	54.07	68.65	59.19	67.22	67.22
Staff Subtotal	62.93	56.85	54.07	68.65	59.19	67.22	67.22
Facility Subtotal	6.94	8.33	6.94	7.57	7.29	7.41	7.41
Tape Recorders/Record Players	.85	1.02	.85	.46	.89	.56	.56
Teaching Machines	.12	0	0	.06	.06	.07	.07
Movie/Filmstrip Projectors	.47	0	.47	.25	.35	.30	.30
Slide/Overhead/Opaque Project.	.03	.19	.16	.09	.10	.07	.07
Television/Video Tape Players	.04	0	0	0	.02	.01	.01
Equipment Subtotal	1.51	1.21	1.48	.86	1.43	1.02	1.02
Basal Readers	4.08	0	0	0	2.04	1.02	1.02
Individual Reading Kits	.05	0	0	.01	.03	.02	.02
Library Books	1.17	1.17	1.17	1.17	1.17	1.17	1.17
Other Supplies and Materials	.14	.14	.14	.14	.14	.14	.14
Materials Subtotal	5.44	1.31	1.31	1.32	3.38	2.35	2.35
Total Cost	76.82	67.70	63.80	78.40	71.26	78.00	78.00

STUDY OF COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 906

Class	21	41			
Number of Sessions	4	4			
Number of Students	31	37			
Number in Grade 2	0	18			
Number in Grade 4	10	0			
Number in Grade 6	10	0			
			Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade	Weighted Average Cost for the Sixth Grade
Resource					
Class Instructor	65.77	55.11	55.11	65.77	65.77
Teacher Aide	13.32	11.16	11.16	13.32	13.32
Supervision and Coord. Staff	19.07	19.07	19.07	19.07	19.07
Staff Subtotal	98.16	85.34	85.34	98.16	98.16
Facility Subtotal	7.26	6.08	6.08	7.26	7.26
Tape Recorders/Record Players	.12	.10	.10	.12	.12
Movie/Filmstrip Projectors	.10	.01	.01	.10	.10
Slide/Overhead/Opaque Project.	.04	.04	.04	.04	.04
Equipment Subtotal	.26	.15	.15	.26	.26
Library Books	.59	.59	.59	.59	.59
Other Supplies and Materials	.17	.17	.17	.17	.17
Materials Subtotal	.76	.76	.76	.76	.76
Total Cost	106.44	92.33	92.33	106.44	106.44

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 908

Class	21	41		
Number of Sessions	1	1		
Number of Students	26	26		
Number in Grade 2	5	5		
Number in Grade 4	9	8		
			Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade
Resource				
Class Instructor	37.99	43.34	40.66	40.51
Teacher Aide	5.69	5.69	5.69	5.69
Supervision and Coord. Staff	9.10	9.10	9.10	9.10
Staff Subtotal	52.78	58.13	55.46	53.30
Facility Subtotal	6.19	6.19	6.19	6.19
Tape Recorders/Record Players	.01	.13	.07	.07
Movie/Filmstrip Projectors	.01	.01	.01	.01
Slide/Overhead/Opaque Project.	.01	.01	.01	.01
Television/Video Tape Players	.01	.01	.01	.01
Equipment Subtotal	.04	.16	.10	.10
Individual Reading Kits	.02	0	.01	.01
Other Supplies and Materials	.12	.12	.12	.12
Materials Subtotal	.14	.12	.13	.13
Total Cost	59.15	64.60	61.88	61.72

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 915

Class	21	41			
Number of Sessions	3	3			
Number of Students	29	31			
Number in Grade 2	15	0			
Number in Grade 4	0	10			
Number in Grade 6	0	10			
			Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade	Weighted Average Cost for the Sixth Grade
Resource					
Class Instructor	20.52	20.88	20.52	20.88	20.88
Supervision and Coord. Staff	20.80	20.80	20.80	20.80	20.80
Staff Subtotal	41.32	41.68	41.32	41.68	41.68
Facility Subtotal	3.64	3.40	3.64	3.40	3.40
Tape Recorders/Record Players	.08	.02	.08	.02	.02
Movie/Filmstrip Projectors	.01	.01	.01	.01	.01
Equipment Subtotal	.09	.03	.09	.03	.03
Basal Readers	.09	.08	.09	0.08	.08
Individual Reading Kits	.01	0	.01	0	0
Other Supplies and Materials	.04	.04	.04	.04	.04
Materials Subtotal	.14	.12	.14	.12	.12
Total Cost	45.19	45.23	45.19	45.23	45.23

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS
AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES
School: 917

Class	21	
Number of Sessions	1	
Number of Students	14	
Number in Grade 2	14	
		Weighted Average Cost for the Second Grade
Resource		
Class Instructor	19.72	19.72
Teacher Aide	17.84	17.84
Non-Teaching Non-Academ. Staff	1.95	1.95
Supervision and Coord. Staff	7.64	7.64
Staff Subtotal	47.15	47.15
Facility Subtotal	2.82	2.82
Tape Recorders/Record Players	.22	.22
Teaching Machines	.02	.02
Movie/Filmstrip Projectors	.28	.28
Slide/Overhead/Opaque Project.	.08	.08
Equipment Subtotal	.60	.60
Individual Reading Kits	.20	.20
Library Books	.24	.24
Other Supplies and Materials	.12	.12
Materials Subtotal	.57	.57
Resource Related Center	.83	.83
District Centers Subtotal	.83	.83
Total Cost	51.97	51.97

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS

AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 922

Class	21	22	
Number of Sessions	1	1	
Number of Students	11	10	
Number in Grade 2	11	10	
			Weighted Average Cost for the Second Grade
Resource			
Class Instructor	17.42	17.62	17.52
Teacher Aide	20.86	22.94	21.85
Non-Teaching Non-Academ. Staff	1.08	1.08	1.08
Supervision and Coord. Staff	4.21	4.21	4.21
Staff Subtotal	43.57	45.85	44.66
Facility Subtotal	2.84	3.12	2.97
Tape Recorders/Record Players	.23	.13	.18
Movie/Filmstrip Projectors	.17	.09	.13
Slide/Overhead/Opaque Project.	.08	.04	.06
Equipment Subtotal	.48	.26	.38
Basal Readers	0	.49	.23
Library Books	.44	.44	.44
Other Supplies and Materials	.10	.10	.10
Materials Subtotal	.53	1.02	.76
Total Cost	47.42	50.25	48.77

STUDY OF SUMMER COMPENSATORY READING PROGRAMS--READING PROGRAM COSTS BY CLASS
AVERAGE COST PER STUDENT FOR CLASSES WHERE TEACHERS COMPLETED QUESTIONNAIRES

School: 928

Class	21	41			
Number of Sessions	1	1			
Number of Students	27	33			
Number in Grade 2	9	0			
Number in Grade 4	0	11			
Number in Grade 6	0	11			
			Weighted Average Cost for the Second Grade	Weighted Average Cost for the Fourth Grade	Weighted Average Cost for the Sixth Grade
Resource					
Class Instructor	8.86	4.90	8.86	4.90	4.90
Teacher Aide	0	17.61	0	17.61	17.61
Supervision and Coord. Staff	3.15	3.15	3.15	3.15	3.15
Staff Subtotal	12.01	25.66	12.01	25.66	25.66
Facility Subtotal	.98	.80	.98	.80	.80
Tape Recorders/Record Players	.07	.05	.07	.05	.05
Slide/Overhead/Opaque Project.	.01	0	.01	0	0
Equipment Subtotal	.08	.05	.08	.05	.05
Basal Readers	0	0	0	0	0
Library Books	.57	.57	.57	.57	.57
Other Supplies and Materials	.09	.09	.09	.09	.09
Materials Subtotal	.67	.67	.67	.67	.67
Resource Related Center	.14	.14	.14	.14	.14
District Centers Subtotal	.14	.14	.14	.14	.14
Total Cost	13.88	27.33	13.88	27.33	27.33